A CHILTON PUBLICATION

The Iron Age

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NATIONAL METALWORKING WEEKLY

May 29, 1952

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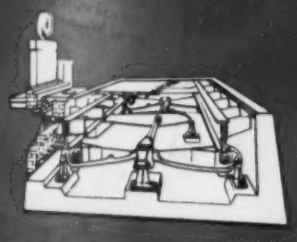

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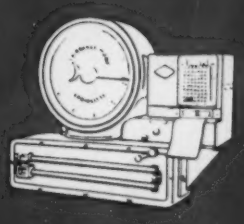

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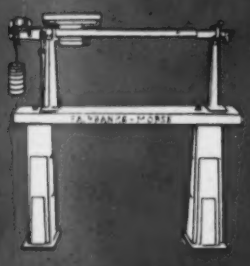

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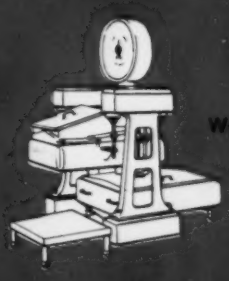

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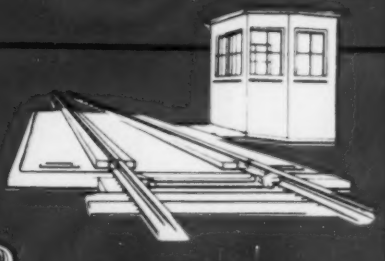

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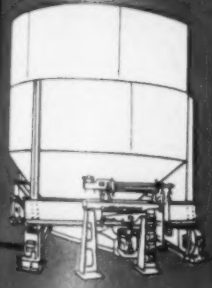

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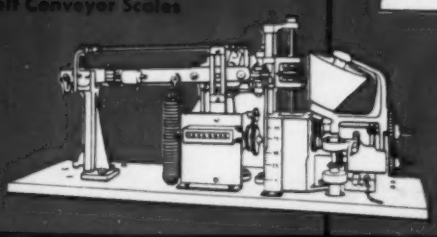

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Photograph at left of turret punch press, with inset showing built-in Cleveland worm-gearing, by courtesy of Wiedemann Machine Co.

CLEVELAND worm gearing drives turret punch press

TO insure the smoothness and precision with which any machine tool must operate, there is an ideal drive—Cleveland Worm Gearing.

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For 40 years Cleveland has devoted its facilities exclusively to engineering and manufacturing highest quality worms and gears. No wonder that so many Clevelands installed in the teens and twenties are still in service.

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Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

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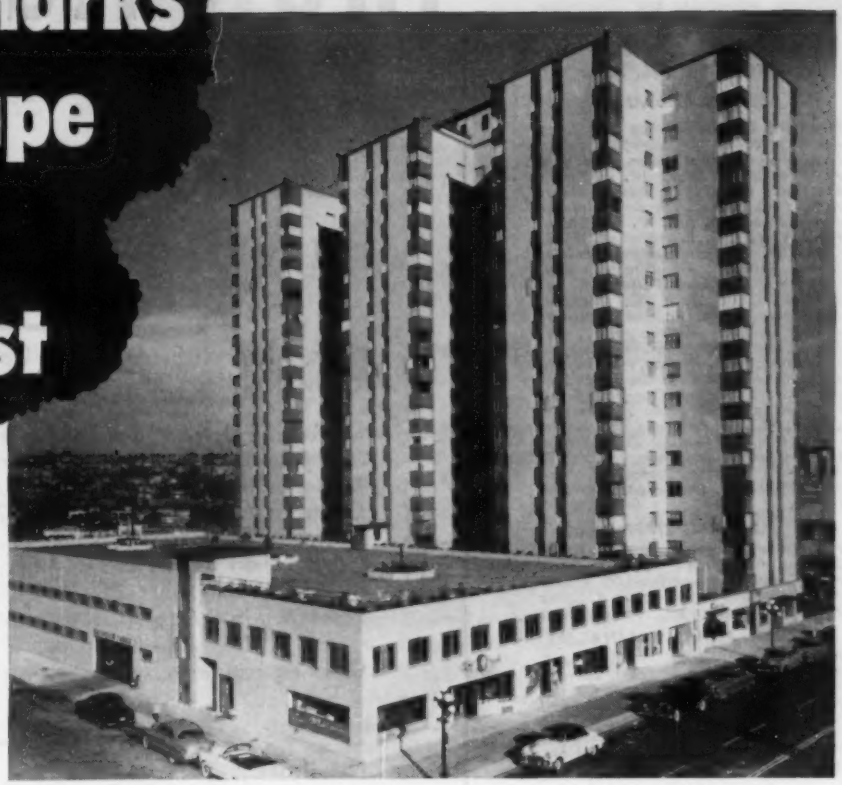
Speed Reducers

New Landmarks Taking Shape Along the Pacific Coast

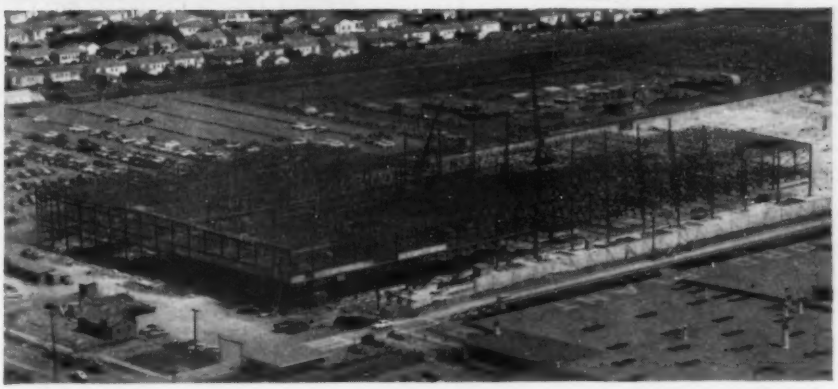


SEATTLE—Grosvenor House, an 18-story reinforced-concrete building with 370 apartments, 19 stores, garage, and roof garden. 1500 tons of reinforcing steel used in the floors and 35 miles of Rayduct steel pipe for the radiant-heating system were furnished by Bethlehem Pacific.

Earl W. Morrison, *Architect;* W. H. Witt Company, *Structural Engineers;* University Plumbing and Heating Company, plumbing, heating and ventilating systems.

SALINAS—The Salinas Valley Memorial Hospital in Monterey County, California. Built along functional lines, this structure will have 108,470 sq ft of floor area. In addition to patients' rooms and operating rooms, it will have allergy rooms, clinical laboratories, and extensive X-ray rooms.

Bethlehem Pacific fabricated and erected the 560 tons of structural steel in this building. Robert Stanton, *Architect;* Parker, Steffens & Pearce, *General Contractors.*



SAN LEANDRO—Addition to the San Leandro, California, plant of the Dodge Division of the Chrysler Corporation. This 2-story building will provide 690,000 sq ft of floor area, automobile storage, and assembly lines. It contains more than 4500 tons of structural steel fabricated and erected by Bethlehem Pacific.

Swinerton & Walberg, *General Contractors;* George H. Miehls, *Structural Engineer.*

BETHLEHEM PACIFIC COAST STEEL CORPORATION

General Offices: San Francisco

BETHLEHEM PACIFIC

BETHLEHEM STEEL

IRON AGE

MAY 29, 1952
VOL. 169, No. 22

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DIGEST

of the week in metalworking

WHAT ARE MANAGEMENT'S PROBLEMS NOW?

PAGE 37

Special IRON AGE survey on the problems of management today shows cost control to be the principal headache. Next on metalworking executives' list of worries is employee relations, with quality control in third place. Executive organization follows, tied by product, sales development.

BUYING PRESSURE FOR REFRACTORIES DIPS

PAGE 41

With surplus inventories reported, the refractory situation has changed from last year when expanding steel pushed up sales. Today buying pressure has slumped. Some observers say perhaps refractories have over-expanded. In the past 4 years capacity has grown from 30 to 45 pct.

PRICE CURBS ON COPPER IMPORTS DROPPED

PAGE 42

Makers of copper wire mill and brass mill products can now buy copper at going prices in overseas marketplaces. The OPS curbs on import prices have now been dropped. Firms can now buy up to International Materials Conference limits. Importers absorb 20 pct of higher prices.

FARM MACHINERY SALES NOT UP TO SNUFF

PAGE 43

While farm equipment sales move downhill and backlogs shorten, Agriculture Dept. claims need for mechanization this year will be high. To meet demand production must be hiked from 15 to 20 pct. An Iron Age check of manufacturers revealed farmers don't buy what it's said they need.

DETROIT WORKERS TO GAIN 3¢ PER HOUR

PAGE 56

Bureau of Labor Statistics will post new price indices on June 1. It means a 1¢ per hr loss for autoworkers. At the same time industry "improvement factors" will raise wages by an estimated 4¢ per hr. Net gain for workers will be 3¢. The auto industry's wage escalator clause remains popular.

WASHINGTON INFLATION CLAIMS DON'T JIBE

PAGE 61

Government economists in this election year are predicting that general price inflation is not in the cards. They say slow-up in some civilian lines will act as a damper. Yet OPS boss Ellis Arnall warns he has discovered disturbing signs of imminent inflation, wants stricter controls regulations.

DO TAPE-CONTROLLED TOOLS HAVE FUTURE?

PAGE 68

At one point in a demonstration of a machine tool controlled by a punched tape mechanism, tool men broke out into snickers. Most did not believe that such equipment would be practical for a long time. Yet others say numerical controls will develop swiftly. Needs are urgent.

SMALL PLANTS FAVOR INDUCTION FURNACES

PAGE 79

Small plants in the Los Angeles area have found electric induction furnaces more suited to their needs than gas furnaces. Cited are: Lower maintenance costs, silicon dispersion without labor, better temperature control, lack of fumes, operator comfort, and lack of heat and fire hazards.

DEVELOP NEW ELECTRO-MACHINING METHOD

PAGE 88

An electro-erosive method, combining electrolyte and electro-arcing effects, is being tested at Frankford Arsenal. It shows promise for the shaping and grinding of single-point carbide tools. A versatile electro-erosion machine is now being completed by a major machine tool manufacturer.

STEEL MEN MEET UNDER GLOOM OF SEIZURE

PAGE 91

Labor headaches thinned the ranks of members attending the 60th General Meeting of the American Iron and Steel Institute in New York May 21 and 22. Gloom spread over every meeting. Top technical paper describing Sejournet hot extrusion process was by Jerome Strauss, Vanadium Corp.

STEEL PEOPLE EXPECT COMPETITIVE MARKET

PAGE 119

Steel producers expect a definitely competitive market in the fourth quarter—possibly in the third. Smaller mills have been feeling it for some time. Surest sign is the absence of strong pressure for delivery from consumers. But the big mills can still book most products with selling.

J & L USES RAMMED OPENHEARTH BOTTOMS

NEXT WEEK

Rammed bottoms used on 250-ton openhearths at Jones & Laughlin Steel Corp. save 3 to 5 days in construction time over former methods. Furnace refractory life is increased by about 10 pct. Bottom installation is simplified. On 10 furnaces J & L picked up 70,000 tons of steel production.

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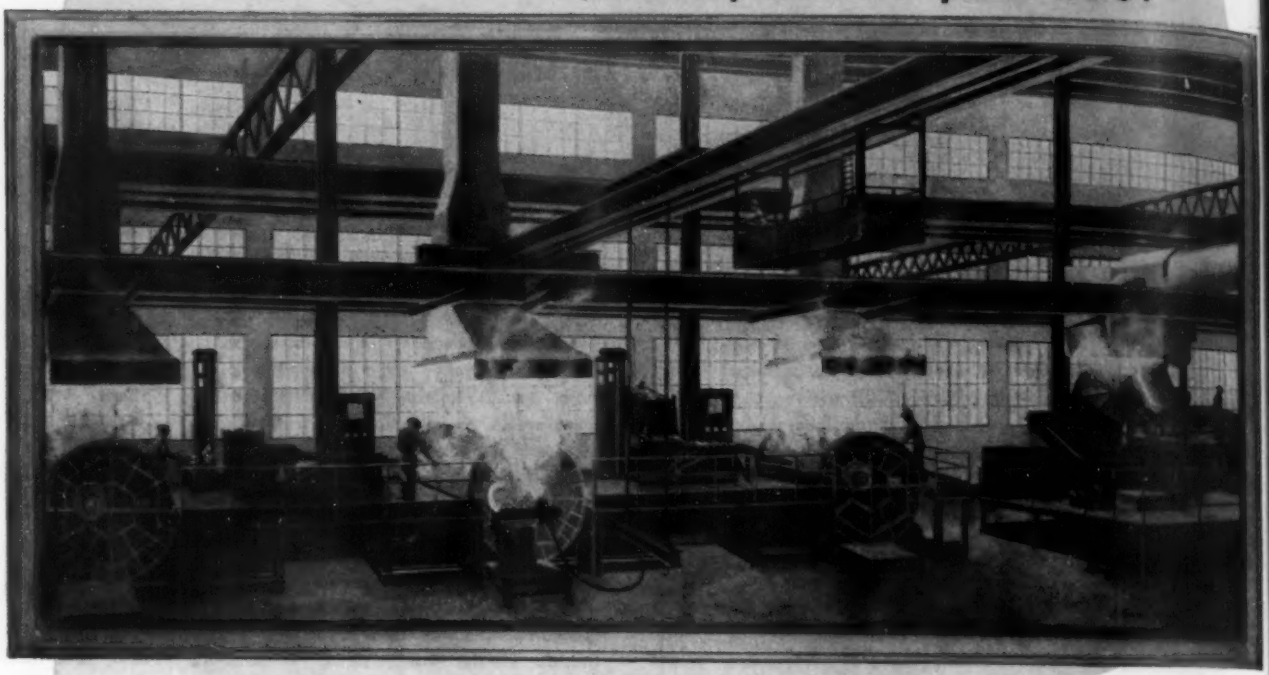
Melting Capacity
30,000 pounds per hour



-and five men
do it all

AJAX INDUCTION FURNACES

In operation at the Waterbury, Conn., plant of the Scovill Manufacturing Company.

As a part of the most modern and completely integrated brass cold rolling operation in the world, Scovill Manufacturing Company of Waterbury, Connecticut, has in operation three 1000 kW. Ajax-Scomet electric induction melting furnaces with a production of 10,000 pounds each per hour. These furnaces, the largest in the brass industry, are equipped with the most precise control of melting temperatures by means of a permanently inserted thermocouple and have thereby considerably reduced melting losses. Every half hour each of these furnaces in turn discharges its 5,000-pound charge into a ladle which is transferred by crane to a holding furnace (shown at right) of 9,000 pounds' capacity. This furnace is mounted over the continuous casting machine located on the floors below, and thus is able to provide a permanent flow of molten brass to the mold. The intermixing of the charges from the three furnaces gives additional uniformity of composition.

WRITE FOR FURTHER DETAILS ABOUT AJAX FURNACES

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the Iron Age
FOUNDED 1855

Labor-Management's Iron Curtain

RECENTLY Vice-President Barkley and Secretary of Labor Tobin joined Harry S. Truman in going down the line for the steelworkers' union. Other Administration lieutenants have also taken an unalterable stand in favor of the union.

By the same token these men have taken a stand against steel companies. It is true that the Supreme Court will decide the steel issue in some way but that will not reflect the depths to which deterioration of management-labor relations has gone. And Mr. Murray may not yet be completely aware of what damage Mr. Truman and others have done not only to his union but to all labor as well.

It is months and months since the steel case started. Solution is no closer today than it was last November. Support that the Administration has given to the union has driven Mr. Murray to the point where he can hardly back down. Yet if he does not back down to some extent there can be no lasting solution.

There was a time, years ago, when management was in the place where labor now stands. It, too, had power—though hardly as much as labor has now.

It should be crystal clear that the union will also have to pay sometime for its drive to have wages go ever upward—at the expense of a good sound financial position for business. Without healthy business it is idle to think that labor could—in the long run—benefit.

Some labor people are privately worried; they think government support may be a kiss of death. Relations are not what they ought to be. There is no collective bargaining.

Wise counsel, a return to real collective bargaining where both sides give, a cooperative feeling for the success of business as well as the union must come—and soon. It is time for labor to realize that using government as a crutch makes labor weaker in the long run. It may not know it but labor is at the crossroads. The Iron Curtain set up by the government between steel and labor must be blasted down.

Tom Campbell

Editor

SCIENCE NEWS FOR YOUR HEAT-TREAT

Scientists have long known that the electrical resistance of a piece of steel will change whenever there's a change in the carbon content of the metal. This basic fact is now being put to work by many progressive metallurgists and heat-treaters. For L&N has applied the principle in a brand-new Primary Element called a Carbohm. In use, a Carbohm projects into the heat-treating furnace . . . looks rather like a thermocouple. Whenever the amount of active carbon in the furnace gas begins to increase or decrease, the Carbohm detects the change. An automatic controller connected to the Carbohm throttles the carbon supply up or down, to keep the furnace gas at desired strength. And a Micromax Recorder plots the result . . . as easy to read as a record of temperature.

For the first time, plant metallurgists can control carburizing by direct measurement of carbon in hot furnace gases.

The complete equipment—Carbohm, Controller and Recorder—is called Microcarb Control. Because the furnace and its temperature control must be designed to meet the needs of atmosphere regulation, Microcarb can be used only with the Series H Homocarb Furnace. It's our opinion—based on 35 years' experience in making fine heat-treating equipment—that any heat-treating department can do better work with Microcarb than by any other known means. And, because Microcarb adds another automatic control to the carburizing process, it should enable your plant to cut the costs of any carburized, mass-produced part or parts.

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To metallurgists, Microcarb means some or all of the above advantages, plus a tightening of technique such as every technician likes. "New" or hard-to-handle steels hold fewer puzzles. Standard steels emerge with closer specifications. The heat-treat takes another long step toward becoming a manufacturing laboratory.

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Dear Editor:

Letters from readers

For All To Know

Sir:

On numerous occasions Tom Campbell's editorials have seemed to me to contain impressive facts which ought to be presented to a larger audience.

Certainly, with the tremendous propaganda resources of the government, all of us should use every source at our command to try to bring what we believe to be the true facts to a disinterested public.

We serve about 300 relatively small users of sheet steel. We do feel that your May 1 editorial "They Should Know—But Do They?" will do some good if sent to them. We ask your permission to reproduce 300 copies of this editorial.

To us, the national situation seems sufficiently serious that we are willing to devote all that can be spared from our profits to try to combat government propaganda. If other small, but vitally concerned, companies would do the same we might see substantial results on election day. If we all sit idly by and "let George do it" we will have no one to blame but ourselves when encroachment by government finally reaches definite confiscatory levels.

J. R. PRATT

Hudson Steel Supply Co.
Providence, R. I.

Electro-Erosion Machine

Sir:

We are greatly interested in the item on p. 65 of your May 15 issue relative to an electro-erosion machine for grinding tungsten carbide tools.

We would be grateful to you if you could give us the name of the manufacturer of this machine.

G. L. HAMMOND
President

Hydra-Feed Machine Tool Corp.
Detroit

For further information on the electro-erosion machine write to the Cincinnati Milling Machine Co., Marburg & Klein Sts., Cincinnati 9, Ohio.—Ed.

Spark Testing

Sir:

This is in answer to the letter written by Mr. P. C. Huang which appeared in your Apr. 3 issue.

You have considerably underestimated the actual technique of visual qualitative and quantitative analysis of steel. Spark testing is not done by the general shop man but by highly trained personnel. Prime requisites are good vision, ability to distinguish all colors, good physical condition, very active imagination, sound judgment, suspicious nature, plus a working knowledge of the different grades of steel.

If you have the requirements and a competent instructor you may be the one of some 20 aspirants to succeed after 9 to 12 months of observation. After your schooling has been completed and you are on your own, you learn every day.

New steels and analysis are constantly encountered. But by this time you can recognize the different sparks as to quantity and quality and by the process of elimination discover to within .05 pct carbon the grade of steel at hand. As you can see I have tried to deflate your balloon of optimism. . . .

O. C. WASHKUHN
Laboratory Technician

Unit Drop Forge Div.
Fuller Mfg. Co.
Milwaukee

Repairing Method

Sir:

We are quite interested in an article you ran in your Feb. 7 issue, p. 145, on wire inserts to repair bolster plate threads.

We would appreciate your advising us who makes this type of insert.

F. A. KRAUSE

Frederick A. Krause Associates, Inc.
Frenchtown, N. J.

The manufacturer of the wire inserts is the Heli-Coil Corp., Danbury, Conn.—Ed.

Core Maker

Sir:

On the Newsfront page of your May 8 issue you featured an item about shell mold castings having been produced for 6 months and also an item about a core making machine producing 300 cores an hr.

Could you advise me where I could obtain more information on these two items?

C. B. ANDERSON
Advertising Manager

Frederic B. Stevens, Inc.
Detroit

The shell mold castings have been produced in a pilot plant operation of the Lynchburg Foundry Co., Lynchburg, Va. The core making machine is being built by the Osborn Mfg. Co., Cleveland.—Ed.

Forming Molybdenum

Sir:

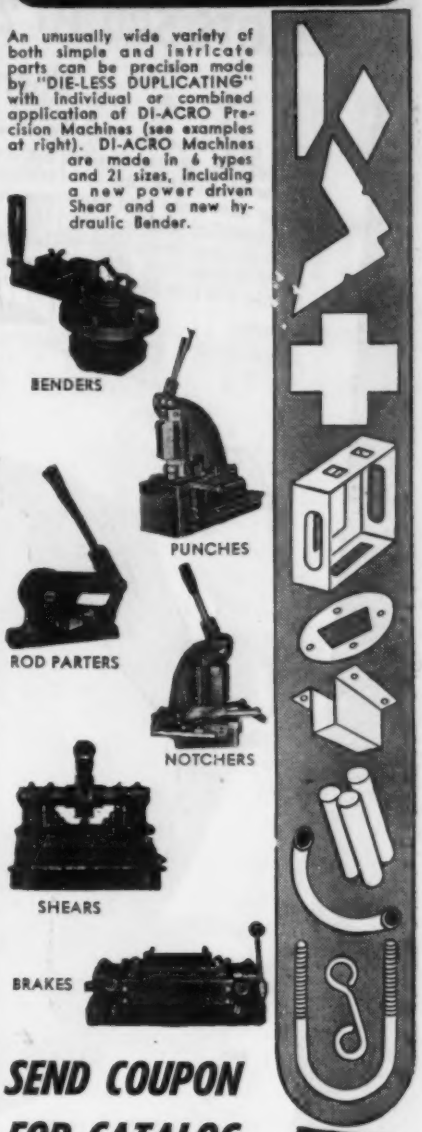
I would appreciate receiving four copies of the article "Novel Methods Used To Form Molybdenum" which appeared on p. 122 of your Apr. 17 issue.

J. HAIME

Fansteel Metallurgical Corp.
North Chicago, Ill.

DIE-LESS DUPLICATING
with di-acro PRECISION MACHINES

An unusually wide variety of both simple and intricate parts can be precision made by "DIE-LESS DUPLICATING" with individual or combined application of DI-ACRO Precision Machines (see examples at right). DI-ACRO Machines are made in 6 types and 21 sizes, including a new power driven Shear and a new hydraulic Bender.



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SCREW SLOTTING NEWS

REVOLUTIONARY, NEW WATERBURY-FARREL MACHINE SLOTS 500 TO 2000 FINISHED BLANKS PER MINUTE

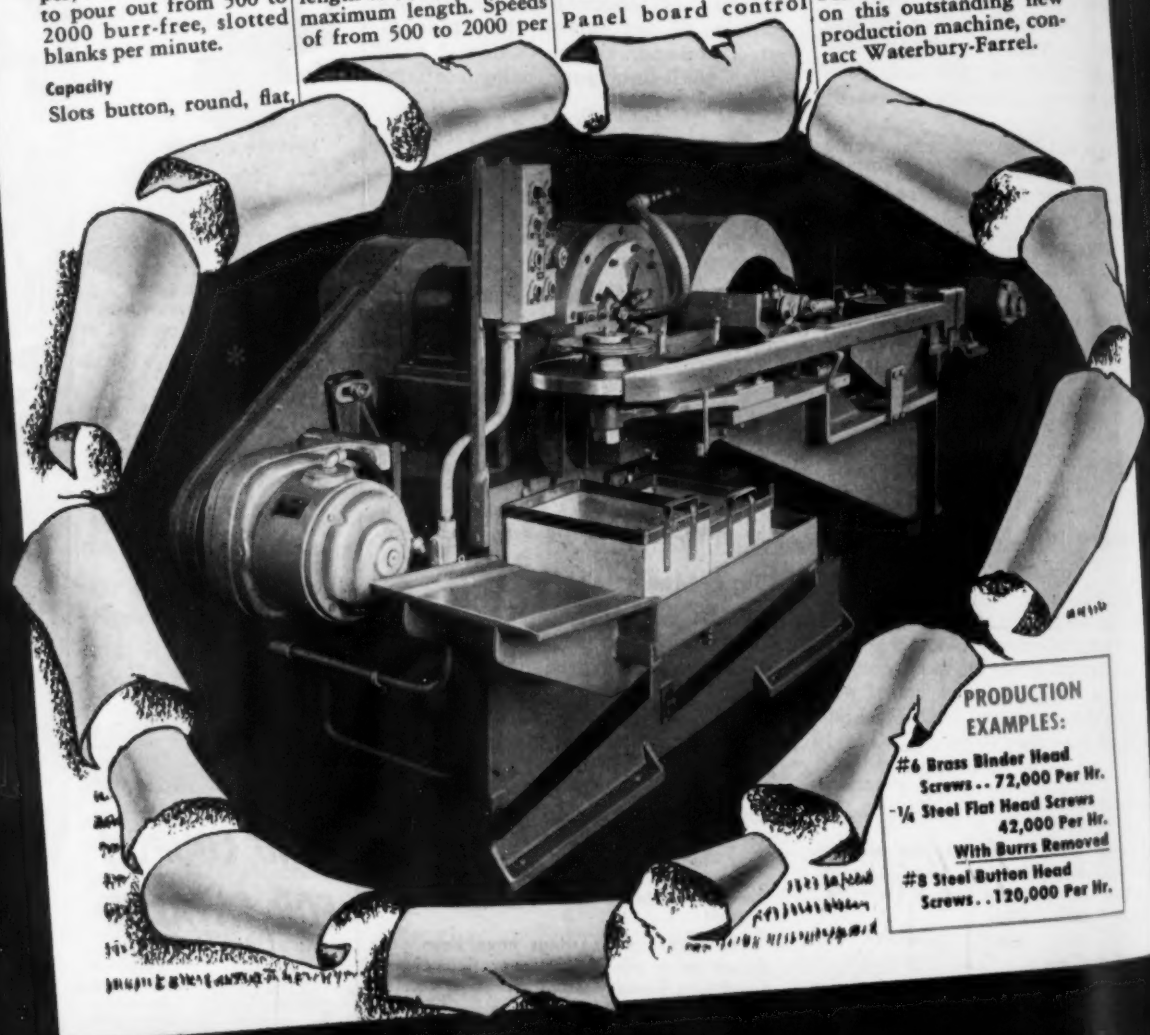
Unprecedented Saw Life Per Grind

This new Waterbury-Farrel #1 High Speed Screw Head Slotting Machine uses only one hopper, one dial and one saw to pour out from 500 to 2000 burr-free, slotted blanks per minute.

Capacity
Slots button, round, flat, flat oval, fillister, truss or binder heads (of brass or standard lower carbon machine steel), in sizes from #6 by ¼" minimum length to ¼ by 3" overall maximum length. Speeds of from 500 to 2000 per min. depend upon shape and size of head and whether steel or brass is used.

Fully Electrically Driven . . . Lubrication Safety Interlocked
Panel board control switches are safety interlocked so that oil flow must be started first. Then the saw, dial and feed are each started in that order by separate switches.

For further information on this outstanding new production machine, contact Waterbury-Farrel.



PRODUCTION EXAMPLES:
#6 Brass Binder Head Screws . . 72,000 Per Hr.
-¼ Steel Flat Head Screws 42,000 Per Hr. With Burrs Removed
#8 Steel Button Head Screws . . 120,000 Per Hr.

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Offices: Chicago, Cleveland and Millburn, N. J.

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WF-3

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Fatigue Cracks

by Charles T. Post

Hard Core

No small factor in your f.f.j.'s ability to gather rapidly news and market information from far points is the teletype network which binds together its district offices. No other business publication has anything quite so extensive along this line. Sometimes the district editors, harried with inquiries from the home office, are secretly envious of magazines that have to rely on air mail and Western Union.

Take Dick Raddant, the Detroit editor. Last week the New York markets desk was heckling him over scrap prices. Piled up on his desk were half a dozen other assignments that had to be completed before the rapidly approaching deadline. Just then the bell on the teletype rang. He switched it on and it began mechanically clicking off this message:

IRON AGE NY TO IRON AGE DET. RUMOR HERE HAS IT THAT DETROIT TIGERS USING STEEL CORED BASEBALLS. HAVE RADDANT CHECK TO SEE IF THESE CORES ARE CAST, MOLDED OR MACHINED AND ALSO WHETHER CMP WILL APPLY. END.

Like other district editors Raddant was perfectly sure that all New York editors are naturally balmy, but orders are orders. Just as he had reached the Tigers' publicity office on the phone, the door opened and there was the humorist from the office next door . . . which also has a teletype machine.

Peach Pits

Most people never have wondered what to do with old peach pits. They put them in the garbage can, and that's that. Therefore, it was something of a surprise when one of our correspondents sent us a hobby column torn from one of the family magazines. There, at the top of the page, was a proud account of a man who makes peach pits his hobby.

"I carve monkeys from peach seeds," he explained, thereby taking home the $2 prize. He told how he used a sharp knife, a three-cornered file and a small drill. And he submitted two drawings showing how a peach pit might become one of two types of monkeys. From the drawings, the monkeys looked for all the world like fetuses, crouched and cramped.

The man didn't say what he did with his peach pit monkeys after he had carved them, but we suppose there is a market for everything.

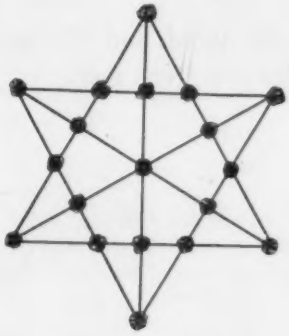
Actually, what bothers us more than peach pits is the problem of what to do with the toothpicks used to hold sausages and shrimp at cocktail parties. We have a prodigious appetite for such edibles, but we have to hold back because of the problem of disposing of the toothpicks. Before the war we used to put them in our trouser cuffs, but got out of the habit when cuffless trousers were introduced.

Aptronym

Miss Roberts of your f.f.j.'s Chicago office is preening her feathers over finding a news item which reports that a son was born on May Day to Mr. and Mrs. Robert Wren of Decatur. The baby was delivered by Dr. H. F. Bird.

Puzzlers

If you had arranged the rows of trees to form a six pointed star, as shown below, you would have been eligible for the position of gardener. P. L. Price, New York, is the first one in with this answer.



The answer to the number puzzle of two weeks ago is 55/126, say our experts L. D. Rice, Timken Roller Bearing Co.; R. W. Huff, Canton, Ohio; C. M. Dahlen, Madison, Wisc., and W. E. McCord, Baltimore, Md.

A. Romeo, Denison Engr. Co., joins the first team with his answer to the fly problem. M. E. Pease, Derby & Co., Ltd., and E. Witherstay, Taylor-Winfield Corp., have just solved the land division problem.

J. L. Vaupel, Barium Steel Co., sent this one in: A salesman in a convertible weighing 3500 lbs is driving along the Pennsylvania Turnpike at 60 mph and comes upon a stalled truck. He smashes into the rear of the truck and in two seconds his car has been brought to a dead standstill. What force resulted from the smash-up?

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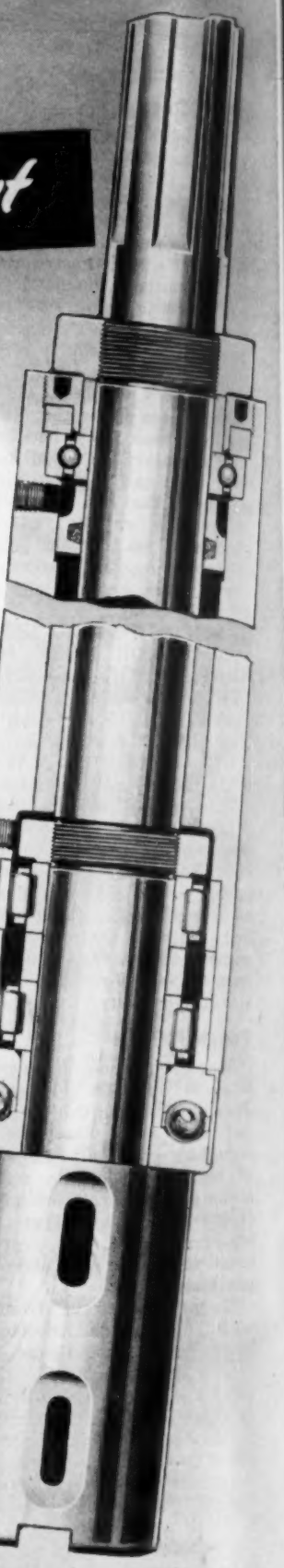
Unusual Tool Capacity

Unusual Spindle Support

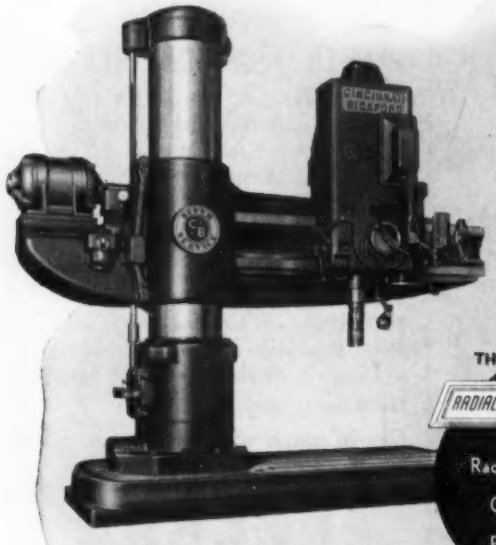


What is full spindle support? What does it accomplish? It's rigid support against thrust and radial load—at ALL positions of the spindle.

In performance, it means accurate, smooth power delivery and long, trouble-free operation.

The multiple spline driven Cincinnati Bickford Super Service Spindle—with its large thrust bearing and its special sliding sleeve—never feeds away from its bearings.

This modern, up-to-date design, with 36 speeds and 18 feeds, also gives a maximum tool capacity for any given size.



Write for Circular R-29 for details of construction of this Cincinnati Bickford Super Service Radial Drill.

This machine is furnished in sizes 11" to 19" diameter column, 3' to 8' arm.

THE CINCINNATI BICKFORD TOOL CO.

RADIAL AND UPRIGHT SUPER SERVICE DRILLING MACHINES

Radials 7½" dia. col., 2½' arm, to 26" dia. col., 12' arm.
General purpose Uprights, 21" to 28" sizes.
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Equal Efficiency of Every Unit Makes the Balanced Machine

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The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

► The easy assumption that the Russians are fourth grade engineers and fifth grade metallurgists is not borne out by studies of enemy equipment captured in Korea. Some of what the U. S. has learned about Russian technology is still classified information but some details (i.e. on tractors) will soon be available.

► Big problem in switching television tube cones from stainless to carbon steel has been one of the metal-to-glass bond. A new type of glass with suitable bonding characteristics has now been developed. Which means that by Fall you can look for carbon steel TV cones in some volume — and with some cost saving.

► Some automotive engineers feel that cost rather than properties is the biggest obstacle to wider use of boron steels in their industry. Most Detroit metallurgists agree that at an attractive price boron steels would find wide permanent usage in 0.30 to 0.50 C, heat treated grades in sections under 3 in.

Right now, International Harvester is using boron for about 62½ pct of all alloy steels: More than ¾ pct of the heat treating grades contain boron and about a fourth of its carburizing grades are boron analyses.

► A new process for extracting Alnico alloys from waste skimmings has gone beyond the pilot plant stage and will soon be in production — recovering valuable nickel and cobalt.

► Here is a figure you can paste in your hat when the discussion of how much steel it takes to build steel capacity comes around again. Buildings and equipment at U. S. Steel's 1.8-million ton a year Fairless Works will require 325,000 tons of steel -- or about one ton within the plant for every 5 tons of capacity. This does not include outside facilities: Ore boats and ore handling facilities, railroad cars, trackage, mine equipment, etc., which would more than double this figure.

► A new line of floating worm-gear-motors permits direct application of power to roller conveyors of rolling mills. Unit is designed so that the shaft of a hollow worm gear can be slipped over an extension of the roller shaft. The manufacturer claims less maintenance, elimination of separate gear reducers and couplings.

► Rumors of early automobile model changeovers this year are exaggerated. It had been predicted that Chevrolet, for example, would bring out its 1953 model in August but a check on plant equipment delivery schedules indicates that November and December are better bets on most new models.

► Alloy conservation paid off well last year. With a push from SAE, help from AISI and an assist from Washington it is estimated that lean alloy and boron steels saved some 12.5 million lb of nickel in 1951.

► Among groups who have the steel jitters are fabricators and refractory makers. The former are worrying about retroactive wage increases on products already shipped and billed; the latter have expanded tremendously and now find demand falling off as steel expansion levels off.

No. 14 Straight Bevel Generator

CONIFLEX® GEARS

Cut on the Gleason No. 14 Straight Bevel Generator

No. 12 Generator Tool Sharpener

Here is the unit that is making Coniflex® gear history . . .

The Gleason No. 14 Straight Bevel Generator, completely universal for roughing and finishing of medium-size straight bevels in moderate quantities; can be used as the ideal machine for finishing only if production requirements warrant it. It also produces a localized tooth bearing (see arrows). Coniflex gears are smooth in operation, easy to assemble, and permit wider operating tolerances.

AUXILIARY EQUIPMENT

No. 13 Universal Gear Tester

BUILDERS OF BEVEL GEAR MACHINERY · FOR OVER EIGHTY-FIVE YEARS · GLEASON

The No. 12 Generator Tool Sharpener (shown above at right) provides accurate and smooth surface finish and long life for the cutting tools used on the Straight Bevel Generator.

The No. 13 Universal Gear Tester (above) assures not only uniform production but simplifies final assembly by pre-establishing the best running position of the gears.

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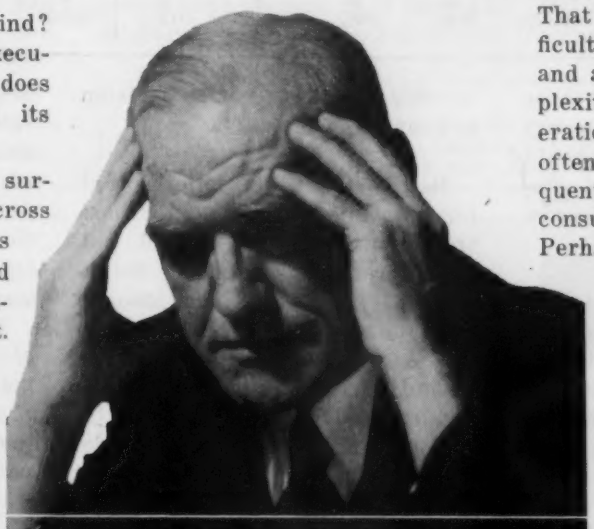
MANAGEMENT: What's Wrong in Your Plant?

Iron Age survey shows cost control is No. 1 problem of metalworking executives . . . Employee relations rank second, with quality control in third place—*By G. G. Carr.*

What's on management's mind? What keeps metalworking executives awake at night? Where does American management find its greatest challenge?

To find out, THE IRON AGE surveyed metalworking firms across the country. Top executives were asked which of ten broad areas of management responsibility concerned them most. (Taxes, controls and unions were specifically exempted, on the grounds that no individual firm can do very much about them.)

Replies were received from 201 key management executives. Their answers are tabulated in the box on this page. Since practically all replies mentioned more than one problem, percentages will, of course, add up to more than 100 pct.



What's Your Headache?
Results of THE IRON AGE Management Survey

Problem	No. of Replies	Pct. of Total Replies
Cost Control	124	62.9
Employee Relations	106	52.7
Quality Control	103	51.2
Executive Organization	67	33.3
Product & Sales Development	67	33.3
Maintenance	62	30.8
Research & Market Analysis	45	22.4
Communications	44	21.9
Community Relations	35	17.4
Pension & Retirement Plans	25	12.4

Cost First—Not too surprisingly, cost control led the field. Cost consciousness is, of course, a prerequisite for businessmen. It's even more important in these days of price and material controls.

The high place (62.9 pct of all replies) employee relations occupies in executive thinking is undoubtedly more than just concern over labor unions. In one form or another it is the most personal of all challenges to management.

It is curious that the related problems of communications and community relations received such low ratings—21.9 and 17.4 pct respectively. Management has been under fire recently for inept communication techniques. But most of the criticism—and the severest—has come from businessmen. There's a good chance that a similar survey in 1957 will show these problems much higher on the list.

Quality — As products grow more complex, quality control increases in importance. Metalworking's concern with the quality of its products is shown by the 103 executives—51.2 pct—who listed quality control as a major concern. And defense orders make it even more important. The Air Force already specifies the quality control system to be used on its purchases. (THE IRON AGE, May 8, 1952, p. 119.)

Executive organization was mentioned by one-third of all replying. That so many companies find difficulty in assigning responsibility and authority points up the complexity of modern industrial operations. Areas of responsibility often blur into one another; frequently several people must be consulted about the same thing. Perhaps the problem is one of executive selection rather than organization.

Sales—Product and sales development is still bothering many people, in spite of defense order backlogs. As materials for consumer goods become easier it is sure to occupy an even more prominent place in management thinking. Some retailers are already complaining that lack of really new products is hurting sales. (THE IRON AGE, May 22, 1952 p. 80.) And Reg. W's end failed to produce the expected horde of customers.

Effective maintenance is a headache to 30.8 pct of management. One executive commented that his biggest problem here was getting a reasonable amount of work from his maintenance crews. Lack of a basis for incentive pay was claimed as the main reason.

Relatively few companies have trouble with research and market analysis. But market analysis ties in closely with sales, and might justify more attention from that standpoint.

It is surprising to find pension and retirement plans trailing the list. Since both executives and

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ANALYSIS OF REPLIES BY PLANT SIZE

(Based on 180 Replies)

Size of Plant by No. of Workers	Cost Control	Employee Relations	Quality Control	Executive Organization	Production and Sales Development	Maintenance	Research and Market Analysis	Communications	Community Relations	Pension and Retirement
Under 500 Workers	4 (57%)	4 (57%)	1 (14.2%)	2 (3.4%)	6 (85.7%)	2 (28.6%)	3 (42.9%)	1 (14.2%)	2 (28.6%)	2 (28.6%)
500 to 999 Workers	48 (56.5%)	42 (49.4%)	38 (44.7%)	25 (29.4%)	31 (36.5%)	24 (28%)	19 (22.4%)	18 (21.2%)	8 (9.4%)	5 (5.8%)
1,000 to 2,499 Workers	39 (66.4%)	28 (49%)	31 (54.4%)	22 (37.9%)	14 (24.6%)	20 (35%)	8 (14%)	13 (22.8%)	13 (22.8%)	10 (17.5%)
Over 2,500 Workers	20 (64.5%)	17 (54.8%)	16 (51.6%)	9 (29%)	6 (19.4%)	13 (41.9%)	7 (22.6%)	12 (38.7%)	9 (29%)	3 (9.7%)

wage earners are affected by these plans, they were given a category of their own. Possibly they should be incorporated in a broader category, such as personnel administration.

By Size—Analysis of replies by plant size (number of workers) reveals no drastic change in the relative status of cost control. Larger plants find it even more of a problem than smaller ones probably simply because they buy more.

Medium-sized firms appear to have slightly less trouble with employee relations than either large or small ones. Size creates its own problems, and some large firms are finding it more satisfactory to operate as a collection of smaller units. This method has one great advantage in employee relations: Workers are less likely to feel like cogs, lost in a vast, impersonal organization.

Smaller firms usually lack both the money and facilities to copy the personnel techniques of larger companies. Fewer employees frequently also mean less compulsion to copy these devices.

Help Wanted—It follows that big companies would have the most trouble with quality control, but it's interesting to note that everybody has about the same amount of trouble with executive organization. Good men are always hard to find, particularly in times of expanded production.

Young, growing firms obviously worry more about product and sales development and research and market analysis than do larger, well-established ones. Maintenance problems also grow with the company, but not drastically so. Communications and community relations on the other hand are felt to be almost exclusively a big industry problem.

By Type—Of all groups reporting, metal fabricators are the least bothered by cost control. Machinery builders worry about it the most, with primary metal producers and transportation equipment makers not far behind. The feast-or-famine state of the machinery industry makes costs a major concern, while the expensive facilities needed in metal production and transport goods production provide a strong reason for watching expenses.

Metal producers worry most about employee relations, probably mainly because of union aggressiveness and the number of people involved. Machinery makers, faced with a shortage of skilled labor, want to hang on to what they have. They also have to work to close tolerances, and quality control is more important to them than to other groups.

Heavy Goods — Producers of large heavy goods are the most conscious of the need for good executive organization. Product and sales development and research and market analysis keep machinery builders awake nights, but maintenance doesn't bother them so much as it does the heavy industries.

ANALYSIS OF REPLIES BY INDUSTRY GROUPS

(Based on 180 Replies)

U. S. Std. Industry Codes	Description of Industry Groups	Cost Control	Employee Relations	Quality Control	Executive Organization	Production and Sales Development	Maintenance	Research and Market Analysis	Communications	Community Relations	Pension and Retirement
33	Primary Metals	24 (53.3%)	27 (60%)	19 (42.2%)	14 (31%)	11 (24.4%)	19 (42.2%)	5 (11%)	13 (28.9%)	12 (26.7%)	7 (15.6%)
34	Fabricated Metal Products	9 (42.9%)	14 (66.7%)	11 (52.4%)	6 (29%)	8 (38%)	7 (33.3%)	3 (14.3%)	7 (33.3%)	3 (14.3%)	2 (9.5%)
35	Machinery Manufactures	36 (69.2%)	24 (46.2%)	28 (53.9%)	13 (25%)	23 (44.2%)	10 (19.2%)	21 (40.4%)	15 (28.9%)	5 (9.6%)	4 (7.7%)
36	Electrical Equipment	14 (56%)	7 (28%)	16 (64%)	11 (44%)	5 (20%)	5 (20%)	4 (16%)	2 (8%)	5 (20%)	1 (4%)
37	Transportation Equipment	25 (69.4%)	19 (52.8%)	18 (50%)	15 (41.7%)	9 (25%)	13 (36%)	4 (11%)	5 (13.9%)	6 (16.7%)	6 (16.7%)

SULFUR: Keen Edge of Shortage Dulls

U. S. brimstone's purest, cheapest form of sulfur . . . Mined with hot water . . . Steel, petroleum industries' demand stays strong . . . Europeans are eager for brimstone—*By T. Metaxas.*

Molten yellow sulfur gushes in a stream from a long nozzle at Freeport Sulphur Co.'s famous salt dome mine in Grand Ecaille, La., lying in the shelter of a bay in the Gulf of Mexico. As the paste-like sulfur sloshes to the ground, it begins to take semi-solid form. The scene is a vast plain dotted with tall drilling rigs, resembling those of the oil industry, and Frasch process equipment.

Sulfur is a once-ample mineral locked in the earth. Man can mine it without laborious cutting of subterranean shafts to reach deposits. It's melted and floated up to the surface by hot water pumped into sulfur pockets.

This is American brimstone, the cheapest and purest form of sulfur found on earth. We have a near monopoly in brimstone and it can find a market at any foreign port.

Shortage Dulls—Four-fifths of sulfur produced is made into sulfuric acid, used in the steel industry's tanks to descale plates and sheets. Fertilizer, paper, textile, paint and pigment, petroleum refining, chemical industries cannot operate without it.

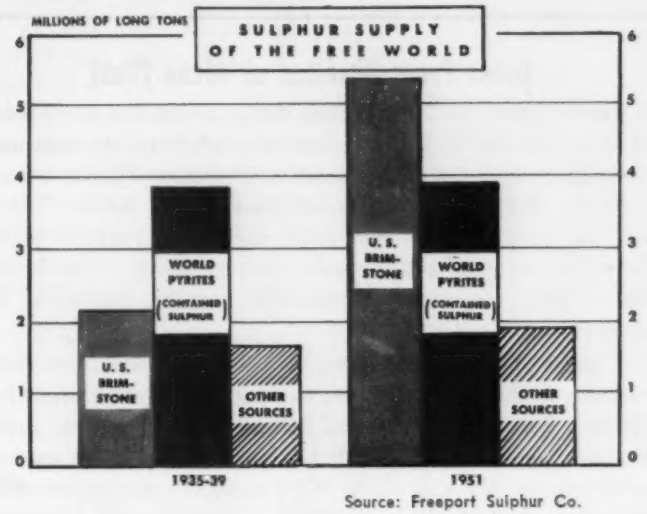
Sulfur is still in shortage. But now the keen edge of that shortage, felt all over the world, is being dulled. For the first time since Korea, manufacturers here are not accepting fully their National Production Authority rations. But steel and petroleum refining industries continue to exert an unflagging demand for sulfur. Because these industries are essential to defense, their supplies have been sheltered by Washington.

Domestic sulfur demand has slowed up in some industries because of somewhat deflated consumer buying of their products. Textiles which use the acid to make viscose rayon have felt the sting of buyer apathy. Consistently voracious before, paper plants have lowered their demand slightly. Steel and other industries have been combatting the shortage with conservation measures. Makers of steel have been stretching out the life span of the acid in their pickling tanks.

Stockpiles Shrivel—Because of the shortage sulfur producers' stockpiles have shriveled from the safe supply of 1½ years to the "dangerous minimum" of a shade over 6 months. Resurgence of industry in the postwar period ate into the stockpile with unprecedented greed. In pre-World War II times, European plants relied on sulfur produced from iron pyrites. After the war came a mass recognition of the economic advantages in using American brimstone. It cost the Europeans less to build plants designed for brimstone. War damaged plants were reconstructed and new plants built with this equipment.

Reliance on the cheaper U. S. brimstone became heavy. At the same time American industry more than doubled its pre-war rate of sulfur consumption.

Some Europeans have now learned the shortage lesson. They are again shifting back to pyrites sulfur. The trend is not too widespread and THE IRON AGE was told by one domestic producer that it could stop in its tracks when brimstone again became abundant.



Source: Freeport Sulphur Co.

Just Brimstone—American postwar production climbed to meet greater demands. It could not leap high enough because the government-controlled price for brimstone was $21 to $22 a ton. At that brimstone price, marginal brimstone mines and other methods of recovering sulfur, such as from smelter and refinery gases, pyrites, could not be exploited. The stockpile was sapped.

American output of brimstone in 1951 was 5.3 million gross tons. Another 900,000 tons came from pyrites and gases. New salt dome mines will raise U. S. production by 700,000 tons in 2 years. Total world production this year is estimated at 12.3 million gross tons. Overseas expansion projects will help lever up total world output to 15 million tons by 1954. The shortage then will truly be over.

In 1950 the U. S. exported 1,440,-

000 gross tons to Europe and Canada. When NPA took over domestic and export allocations in January, 1951 (to sulfur producers' gratification), exports dipped to 1,300,000 tons. Exports continue at that rate this year.

Loses Some Pep—But there are some indications that overseas demand has lost a little of its appetite for brimstone. This may be accounted for partly by expanded production there. For instance, Canada, which has been authorized 345,000 tons of brimstone in 1952, has been importing at a rate of 325,000 tons.

Meanwhile America in filling half of the Free World's sulfur needs has been exporting 25 pct of its production. Letting the Europeans dig into the U. S. treasure box of cheap minerals helps exhaust them. American manufacturers will be paying the higher prices needed to recover sulfur from other methods much sooner than if the Europeans had used their own resources.

Giant Press Unveiled at Alcoa Plant

A giant 15,000-ton Schloemann forge press for the production of large aluminum and magnesium aircraft forgings was unveiled at the Aluminum Co. of America's Cleveland Works before top Air Force, Navy and government officials last week. The press, which has been in operation since early this year, is part of a $13.2 million expansion program to enlarge Alcoa's Cleveland forge plant, already the largest aluminum forging operation in the country.

The huge German-built press, on lease to Alcoa from the U. S. Air Force, is the latest addition to Alcoa's hydraulic press forging facilities. Two other presses of 35 and 50 thousand ton capacities now under construction by order of the Air Force are expected to be added to the plant by 1954. With auxiliary equipment the press is valued at $6.2 million. Installed it measures 22 ft long, 18 ft wide and extends 18 ft below ground level and 36 ft above.

Component parts of the press weigh 1628 tons. Single castings weigh more than 120 tons and the 16 nuts which hold the press together weigh 10 tons each. Thirty-two railroad flatcars were needed to carry the press to the Alcoa plant. Parts up to 60 tons were transported by tractor-driven carry-all.

Cutting Oils:

Metalloid Corp.'s additives give greater feed, speed, tool life.

Subject of a recent sales-engineering staff meeting of the Metalloid Corp., held in Huntington, Ind., was progress of Metalloid X-series additives for metal cutting fluids in metalworking applications. These cutting oil additives are said to be giving greater feeds and speeds while prolonging tool life by as much as 200 to 500 pct.

The product is based on a new metal-cutting, heat limiting concept. Special emphasis was placed at the meeting on developing standard methods of setting up and operating machining tests for prospective users. Technical director K. R. Blake discussed recommended test procedures on machining operations using variable speeds.

Increase Depth of Cut—They require calculating the number of cu in. of metal being removed per minute, then increasing the revolutions per minute until the service foot per minute is about double the original speed. The feed should be decreased until the cu in. per minute is no greater than at the lower speed.

After observing tool life at this minimum feed, the depth of cut should be increased until tool life begins to decrease. The test applies to both high speed tools and carbides. Maximum recommended service foot per minute is 200 to 240 for high speed tools and 400 when using carbides.

Higher Iron Ore Output Planned

Lake Superior ore producers and government mining experts are seeking new ways to step up the rate of iron ore output. Among the immediate problems now under discussion: (1) Development of underground mines to greater depths, (2) how to remove economically the heavier layers of overburden to get at open-pit ore.

Government and industry officials agreed that deeper mining operations and removal of overburden will add substantially to overhead.

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REFRACTORIES: Big Stocks Slow Sales

Sales off as demand declines . . . Completion of steel expansion ends tight market . . . Capacity increased almost 40 pct since 1948 . . . Some items still scarce—*By E. C. Beaudet.*

The refractories industry, hard pressed last year to meet needs of expanding steel capacity and other consumers, is now in a period of declining pressure for its products. Surplus inventories have been reported. With the exception of certain specialized refractories, consumers have little difficulty getting materials. In fact, some observers think the industry may have over-expanded in its efforts to meet steel expansion.

In the last 4 years capacity of the industry has increased 35 to 40 pct over 1948. The government had requested an increase of 31 pct to meet the steel industry's goal of 120 million tons a year by the end of 1952. Certificates of necessity totaling over $40 million were granted last year to some ten companies to cover part of their expansion. Now with refractories for the most part in ample supply, Defense Production Administration is expected to scrutinize closely any future applications for fast tax write-offs.

Excess—In the past there has always been an excess of refractories capacity. In any 10-year period the operating rate of the industry has lagged behind the steel industry operating rate. During World War II it was sufficient to take care of all industrial needs. In 1948, a high year of steel operations, production in the refractories industry was about 80 pct of capacity, according to some sources. Thus it seems likely that the 35 to 40 pct increase in capacity will more than compensate for the increase in steel expansion.

However, others point out some companies are operating rehabilitated, old and worn-out facilities to take care of the recent high demand. These will be replaced with newer installations and the situation will balance itself out. Moreover, sales to other industries such as cement, chemicals and oil are strong and are expected to remain so for at least the rest of this year.

Dim View—At present the overall sales picture looks cloudy. A good part of last year's high demand was due to the need of refractories for new construction in the steel industry. These construction programs will gradually come to a close as the year progresses. Another factor contributing to last year's tight market was over-buying to insure progress of expansion programs and to keep operating facilities supplied. Low foundry operations have also had a slowing effect.

Now the steel industry, no longer fearful of a shortage, is reacting more normally in its purchases and is starting to work off excess inventories. With requirements for new construction falling off and consumers not building inventories, sales are off. Another factor is the cautious attitude of some steel consumers who fear another work stoppage in the steel industry. Some refractories producers hope sales will pick up as inventories are worked off and the threat of a strike is eliminated.

In general the production of those refractories which account for about 70 pct of the needs of the steel industry is running about 25 pct below capacity. In some lines it is reported even

STEEL: Finished Shipments Rise in March

As Reported to the American Iron & Steel Institute

STEEL PRODUCTS	CURRENT MONTH					TO DATE THIS YEAR				
	Carbon	Alloy	Stainless	Total	Pct of Total Shipments	Carbon	Alloy	Stainless	Total	Pct of Total Shipments
Ingots	59,146	25,218	2,303	86,667	1.3	172,596	78,289	5,943	256,808	1.3
Blooms, slabs, billets, tube rounds, sheet bars, etc.	175,647	52,773	1,569	230,079	3.3	448,188	159,952	4,862	613,002	3.1
Skelp	10,013	.....	.....	10,013	0.1	33,785	.....	.....	33,785	0.2
Wire rods	70,807	1,312	400	72,519	1.1	202,138	4,832	1,872	208,842	1.1
Structural shapes	425,179	5,721	5	430,905	6.3	1,281,432	13,796	18	1,295,246	6.5
Steel piling	22,204	.....	.....	22,204	0.3	68,801	.....	.....	68,801	0.3
Plates	746,278	34,748	2,734	783,760	11.4	2,087,694	107,135	7,251	2,202,080	11.1
Rails—standard	150,113	.....	.....	150,113	2.2	419,601	79	.....	419,680	2.1
Rails—all other	11,758	.....	.....	11,758	0.2	38,283	28	.....	38,311	0.2
Joint bars	11,140	.....	.....	11,140	0.2	33,958	.....	.....	33,958	0.2
Tie plates	38,871	.....	.....	38,871	0.6	117,384	.....	.....	117,384	0.6
Track spikes	9,115	.....	.....	9,115	0.1	28,890	.....	.....	28,890	0.1
Wheels	33,251	15	.....	33,266	0.5	100,988	66	.....	101,054	0.5
Axles	16,953	6	.....	16,959	0.2	48,870	88	.....	48,958	0.2
Bars—hot rolled	599,326	197,364	4,559	801,249	11.6	1,756,216	586,111	13,005	2,355,332	11.9
Bars—reinforcing	193,272	.....	.....	193,272	2.8	518,594	.....	.....	518,594	2.6
Bars—cold finished	153,111	30,976	4,800	188,887	2.7	450,073	92,960	13,984	557,017	2.8
Tool steel	2,150	10,919	.....	13,069	0.2	7,375	33,301	.....	40,676	0.2
Standard pipe	260,386	18	2	260,406	3.8	736,898	171	5	737,074	3.7
Oil country goods	152,419	14,792	.....	167,211	2.4	*418,825	38,181	.....	*457,006	2.3
Line pipe	313,115	.....	.....	313,115	4.5	915,537	84	.....	915,601	4.6
Mechanical tubing	67,168	20,428	695	88,291	1.3	190,083	74,902	*1,919	*266,904	1.3
Pressure tubing	37,830	4,163	1,114	43,107	0.6	*99,237	11,515	3,167	*113,919	0.6
Wire—drawn	247,824	5,834	3,165	256,823	3.7	742,492	15,010	9,121	766,623	3.9
Wire—nails, staples	68,003	.....	.....	68,003	1.0	206,372	.....	20	206,392	1.0
Wire—barbed, twisted	23,432	.....	.....	23,432	0.3	72,368	.....	.....	72,368	0.4
Wire—woven fence	35,137	.....	.....	35,137	0.5	104,539	.....	.....	104,539	0.5
Wire—bale ties	8,699	.....	.....	8,699	0.1	27,669	.....	.....	27,669	0.1
Black plate	109,158	.....	.....	109,158	1.6	300,781	.....	.....	300,781	1.5
Tin & terneplate—hot dipped	167,584	.....	.....	167,584	2.4	359,001	.....	.....	359,001	1.8
Tin plate—electroplate	310,890	.....	.....	310,890	4.5	776,534	.....	.....	776,534	4.0
Sheets—hot rolled	594,055	20,549	2,262	616,866	9.0	1,750,278	66,440	7,474	1,824,192	9.2
Sheets—cold rolled	710,870	5,822	10,101	726,793	10.5	2,141,549	23,550	30,599	2,195,698	11.1
Sheets—galvanized	177,674	.....	.....	177,674	2.6	495,631	.....	.....	495,631	2.5
Sheets—other coated	18,107	.....	.....	18,107	0.3	59,944	.....	.....	59,944	0.3
Sheets—enameling	14,991	.....	.....	14,991	0.2	43,988	.....	.....	43,988	0.2
Electrical sheets, strip	8,449	45,726	.....	54,175	0.8	24,646	143,193	.....	167,839	0.8
Strip—hot rolled	166,397	3,403	264	170,064	2.5	516,006	9,278	1,822	527,106	2.7
Strip—cold rolled	142,153	1,744	12,122	156,019	2.3	452,816	5,848	35,146	493,610	2.5
TOTAL	6,362,675	481,531	46,185	6,890,391	100.0	*18,248,041	1,464,569	*136,208	*19,848,818	100.0

During 1951 the companies included above represented 98.5 pct of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

lower. Provided there is no change in the international situation, sales are expected to dip further if an anticipated drop in the steel ingot rate takes place late this year. Demand for some items, however, remains at high levels. These include refractories for byproduct coke ovens, blast furnace linings and insulated silica bricks.

Wage Boost?—While growing more concerned with its sales future, the refractories industry is faced with still another problem. It expects to be handed demands for increased wages as soon as the steel wage controversy is settled. Most contracts with CIO, AFL and District 50 UMW unions have already expired. By tacit agreement both sides are awaiting the outcome of the steel industry dispute before starting serious negotiations.

The companies are anticipating requests for a "substantial" wage increase plus additional increases in fringe benefits. Industry officials claim that under present price ceilings they will be unable to meet expected union demands without a price increase. Higher materials, fuel and freight costs will make them unable to operate profitably unless they are able to raise prices to meet increased wages.

COPPER: World Market Curbs Ended

Consumers may now buy all foreign metal available under IMC quotas . . . No price ceilings . . . But buyers must absorb 20 pct of any increases over 27½¢ per lb—*By A. K. Rannells*

Mobilization officials last week chose what seemed to be the lesser of two evils by lifting controls from copper bought on the world market rather than submit to demands for a long term, high price contract.

This government action permits manufacturers of copper wire mill and brass mill products to buy all the foreign copper they can get—within limits of the monthly 130,000 tons allotted by International Materials Conference.

No Ceilings—It also permits them to pay whatever is necessary, either the going world price or the best bargain they can drive.

Likewise, "comparable" treatment will be extended to other primary users of refined foreign copper, including copper produced in this country from foreign ores and concentrates.

But purchasers of foreign copper must absorb 20 pct of any increase they are forced to pay over and above the previously permitted ceiling of 27½¢ per lb. They are permitted to pass on only 80 pct of the additional cost.

Price Rises—This means that consumers of copper wire mill and brass mill products will get proportionate price increases for their products. These will be figured out "under existing pricing standards of the Office of Price Stabilization."

The basic actions do not apply to domestically produced copper. Officials say no increase is being considered in the domestic ceiling of 24½¢ per lb and they are bracing themselves for squawks.

Therefore, increases in ceilings for copper products will call for complicated figuring, based necessarily on the amount of foreign copper used compared to domestic increases.

Other government action on copper during the week was the White House authorization for release of 22,000 tons of copper from the strategic stockpile.

Temporary—Washington opinion was divided with respect to the aftermath of control removal. Generally, a price jump was expected. But many view this as being only of temporary duration. They give as their reasons:

There may show up a lack of foreign competition for world copper since many European consumers are believed to have sizable inventories on hand;

Foreign speculators who have accumulated holdings for speculation may decide to unload in an effort to build up dollar reserves and this would tend to depress the market;

And, domestic manufacturers are generally expected to move cautiously in paying premium or increased prices, particularly in view of softening markets for many consumer durables.

STEEL: Output of Ingots, Castings Falls in April

As Reported to the American Iron & Steel Institute

	Openhearth		Bessemer		Electric		Total			
1951	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Calculated Net Tons Weekly	No. Weeks in Month
January	7,846,657	101.4	431,725	90.4	570,084	88.8	8,848,466	99.9	1,997,396	4.43
February	6,936,993	99.3	326,112	75.6	507,302	87.5	7,770,407	97.2	1,942,602	4.00
March	8,061,346	104.3	408,926	85.6	606,358	94.5	9,076,630	102.5	2,048,901	4.43
1st Quarter	22,844,996	101.7	1,166,763	84.2	1,683,744	90.4	25,695,503	100.0	1,998,095	12.86
April	7,858,839	104.9	392,472	84.9	594,868	95.7	8,845,979	103.1	2,062,000	4.29
May	8,072,994	104.4	408,650	85.6	618,511	96.4	9,100,155	102.8	2,054,211	4.43
June	7,669,449	102.4	403,001	87.1	589,898	94.9	8,662,348	101.0	2,019,195	4.29
2nd Quarter	23,601,282	103.9	1,204,123	85.9	1,803,077	95.7	26,608,482	102.3	2,045,233	13.01
1st 6 months	46,446,278	102.8	2,370,886	85.0	3,486,821	93.0	52,303,985	101.1	2,021,801	25.87
July	7,706,078	99.8	411,599	86.4	566,818	88.5	8,684,495	98.3	1,964,818	4.42
August	7,894,965	99.5	436,822	91.5	607,308	94.6	8,739,095	98.7	1,972,708	4.43
September	7,653,801	102.4	404,726	87.7	601,830	97.0	8,660,357	101.2	2,023,448	4.28
3rd Quarter	23,054,844	100.5	1,253,147	88.5	1,775,956	93.4	26,083,947	99.4	1,986,592	13.13
9 months	69,501,122	102.0	3,624,033	86.2	5,262,777	93.1	78,387,932	100.5	2,009,947	39.00
October	8,028,721	103.8	458,128	95.9	635,037	98.9	9,121,886	103.0	2,059,116	4.43
November	7,750,845	103.5	411,954	89.1	636,553	102.4	8,799,352	102.6	2,051,131	4.29
December	7,885,830	102.2	396,831	83.3	608,017	94.9	8,890,678	100.6	2,011,466	4.22
4th Quarter	23,665,396	103.1	1,266,913	89.4	1,879,607	98.7	26,811,916	102.1	2,040,481	13.14
2nd 6 months	46,720,240	101.8	2,520,060	89.0	3,655,563	96.0	52,895,863	100.7	2,013,546	26.27
Total	93,166,518	102.3	4,890,946	87.0	7,142,384	94.5	105,199,848	100.9	2,017,642	52.14
1952										
January	8,103,123	100.7	407,298	89.3	625,696	89.7	9,136,117	99.3	2,062,329	4.43
February	7,703,066	102.4	382,712	89.8	571,432	87.6	8,657,210	100.7	2,091,114	4.14
March[1]	8,401,140	104.4	378,861	83.1	624,190	89.5	9,404,191	102.2	2,122,842	4.43
1st Quarter[1]	24,207,329	102.5	1,168,871	87.4	1,821,318	89.0	27,197,518	100.7	2,092,117	13.00
April[2]	7,096,000	91.1	323,000	73.2	564,000	83.5	7,983,000	89.6	1,861,000	4.29

Note—Percentages of capacity operated in 1951 are calculated on weekly capacities of 1 746 337 net tons openhearth 107 806 net tons bessemer and 144 891 net tons electric ingots and steel for castings total 1 999 034 net tons; based on annual capacities as of Jan. 1 1951 as follows: Openhearth 91 054 020 net tons bessemer 5 621 000 net tons electric 7 554 630 net tons total 104 229 650 net tons. Percentages for 1952 are calculated on weekly capacities of 1 816 637 net tons openhearth 102 926 net tons bessemer and 157 477 net tons electric ingots and steel for castings total 2 077 040 net tons; based on annual capacities as of Jan. 1 1952 as follows: Openhearth 94 973,780 net tons, bessemer 5,381,000 net tons, electric 8,232,890 net tons, total 108,587,670 net tons.

[1] Revised. [2] Preliminary figures, subject to revision.

MACHINERY: Output for Farms Slows

Farmers aren't buying what official reports say they need . . . Though sales are slipping, implement makers want a bigger share of steel in second half—*By K. M. Bennett.*

Though farm equipment sales are slipping, and backlogs are smaller, the producers of tractors and plows and the rest of agriculture's capital equipment aren't joyful about the amount of steel they expect to have available in the next few months.

Reports from state production and marketing committees of the Agriculture Dept. indicate the farmers' need for mechanization will be high in the second half of 1952 and throughout 1953. They estimate to meet requirements over the next 18 months it will be necessary to increase present production from 15 to 20 pct. Here are their reasons: (1) Farm output depends more on mechanized equipment than ever before. It's more than 70 pct greater than at the beginning of World War II. (2) Materials curtailments have reduced output 15 pct below requirements. (3) They expect high dollar exports.

But Slow to Buy—But an IRON AGE check of farm equipment sales shows that the farmer isn't buying what these reports indicate he needs. This year opened with equipment sales at a fast pace, though the forerunner of a selling dip was already being forecast in the increasing light tractor inventory (THE IRON AGE, Apr. 10, p. 76). This trend has continued, is spreading into other equipment lines.

But slackening production schedules have not brought steel (hot rolled bars and plates) into abundant supply for even these long standing customers of bar and plate mills. In the face of cut production schedules, there is a need for more steel in particular lines, and some feeling is evident that the situation is not going to ease in third quarter.

Implement makers' difficulties vary with each firm contacted. A large producer reports that his chief problem is plates. Though the firm has cut production schedules, it will be necessary to (1) buy a special fabricated plate item, which will increase cost, (2) make a major engineering change in his product. He believes that his fourth quarter bar supply will be smaller. At present he feels he could use another 550 tons of steel, mostly in bars, plates, per quarter.

Needs Forgings—A second large producer has been pinched for steel forgings, has eked out his suppliers inventories with his own steel on occasion, and now expects increasing tightness in cold-rolled bar supplies available to him in fourth quarter.

As a general rule, bars are presenting more of a problem to farm equipment builders than are plates. But in plates, too, effects of the steel shutdowns are beginning to be felt. An equipment manufacturer was notified last week that a heavy plate shipment would be delayed 5 to 6 weeks partly as a result of the steel mill difficulties.

Another bar-tight producer figures he'll be scratching hard for 300 tons of bars that he still needs for third quarter. He predicts bars will be in tighter supply in third and fourth quarters. This despite the fact that, like several other farm producers, he's cautiously paring his inventories. The shortage is in bars over 1 in.

Late Delivery—A producer who has cut his production schedules twice in the last 2 months learned last week that his deliveries of alloys and special bars would be 3 to 4 weeks behind schedule. He had felt that his steel worries, save for forging quality bars over 1.5 in., were pretty well over. He had expected an easing in bar supply in the third and fourth quarter, though he had been told that the military had increased its slice of cold finished bar production for fourth quarter.

The industry's immediate working inventories are fair, running from 2 weeks up to 6 at present. If trouble comes, it will be early in the third quarter.

One rumor runs continually through the farm equipment industry. That high priority defense producers, or government agencies, are stockpiling the bars and plates that farm equipment people need. If there is an ample supply of plates and bars in fourth quarter, they believe, it will be partially because these stockpilers have been forced to dump their steel holdings.

Electric Plant Nears Completion

Erection of a new 460 x 80-ft building to house two 18-ton capacity electric steel melting furnaces for the Chicago plant of Ingersoll Products Div. of Borg Warner Corp. is nearing completion. Output of the new furnaces, pegged at 240 tons a day, will be channeled for company's agricultural and automotive products. Furnace charge will be scrap.

When the new plant begins production it will operate around the clock on a 3-shift basis, 30 days a month.

BUILDING: Will '52 Be Record Year?

Easing controls, shortages, relaxation of bans may send construction to new highs . . . Despite handicap dollar volume of first quarter is at peak . . . Industry builds—*By A. K. Rannells.*

Easing of shortages and relaxation of controls over structural steel may result in an upsurge in construction which may well send the 1952 dollar volume to a new high figure.

Already, despite controls and materials shortages, dollar volume is at an all-time high. The figure for the first 4 months stands at $8.9 billion—with the big season just beginning.

Industrial building, spurred by the expansion program for defense production, is running second only to residential construction. The figure for the first 4 months is $1.2 billion, including $370 million in government projects.

Take Up Slack — Industrial building may be expected to slow down later this year as some of the larger projects near completion. The slack is expected to be more than taken up by increased commercial-type construction — such as stores, garages, etc. Relaxation of controls is the key to this increase.

Commercial building for the first 4 months dropped to $322 million from $496 million for the same period last year. But something like 1500 held-up projects have recently been approved by control officials, who at the same time removed the ban on recreational and amusement-type construction.

And in spite of governmental intent to hold residential housing to about 800,000 family units this year, few doubt that the final figure for new 1952 starts will go well above 1 million units.

Still Strong — Preliminary figures give the April housing starts as 108,000 units, to bring the 4-month total to 347,000 starts—only slightly under 1951. It compares with 411,000 for the same period during the record-breaking year of 1950.

The April housing figure includes 9500 housing starts, a slight reduction in rate but bringing the total this year to 28,500 units. The government goal this year is about 50,000 new starts.

Highway expenditures, now running about $40 million less than the 1951 rate of $430 million are expected to take an upward surge as more steel and other materials are made available.

A Commerce Dept. forecast issued last Saturday predicted that 1952 outlays for new construction would approximate $32 billion. This would be $1 billion more than the 1951 total. Private housing starts were estimated at 1,050,000 new units valued at $9.7 billion, based on expected modification of Reg. X later on this year.

FINISHING UP: Last truss span of the 4-mile Chesapeake Bay Bridge is lifted into place by Bethlehem Steel Co. workers. The span, 360 ft long and 40 ft deep, rides 180 ft above the water in what is believed to be the world's third longest bridge.

Latest Government Appointments

Washington has recently announced the following appointments in defense and related agencies:

Norman B. Melcher, director, Ferrous Metals & Alloys Branch, Minerals Div., Bureau of Mines;

Robert R. Granville, executive director, President's Committee on Government Contract Compliance.

Industry Controls This Week

Automobiles—Amend. 4, Rev. 1, CPR 1 requires auto manufacturers to apply for lower ceiling prices if they sell a car on which a standard item of equipment has been eliminated or modified.

Coal—Coal retailers are permitted to raise ceiling prices to cover freight rate increases under Amend. 6, Rev. 1, SR 2, GCPR.

Line Pipe—Dir. 3, M-46, advances deadline for filing applications for priorities assistance in purchases of line pipe from July 1 to June 5.

Price Relief—GOR 29 allows manufacturers of essential commodities price increases on items being produced at a loss.

UNIVERSITY OF MICHIGAN LIBRARIES

Aluminum Decontrol Supported

Aluminum and magnesium warehousemen have added their support to the drive for decontrol of aluminum late this year.

Meeting with production officials last week, the industry's advisory committee recommended that manufacturers of B products requiring less than 40,000 lb of aluminum per product per quarter be permitted to self-certify for required quantities during the third quarter.

Remaining B product manufacturers would have their third quarter allotments increased to 75 pct of base period for the quarter under the proposal.

It is proposed that varied products be decontrolled completely for the fourth quarter except for defense priorities. No further action would be taken at the time if order boards were filled and a backlog of as much as 3 weeks was created.

But, if by the fourth quarter boards were not filled and such a backlog built up, then B product manufacturers would be given allotments equal to 100 pct of base.

Price Relief for Essential Goods

Pricing relief for an individual firm manufacturing a commodity or supplying a service deemed essential by government price-setters is now available when the firm can show a net loss on the item or service.

General Overriding Reg. 29, effective May 23, makes allowances for price adjustments under such circumstances. Earlier, regulations allowed an adjustment only to companies losing money on overall operations, while the earnings and product standards provided relief on an industry-wide basis.

If a company is not able to qualify for a ceiling adjustment under earnings standard terms because of returns on overall operations, it may still be granted relief to cover unit operating costs for a particular item being produced at a loss. Furthermore, if a firm is within the price adjustment range

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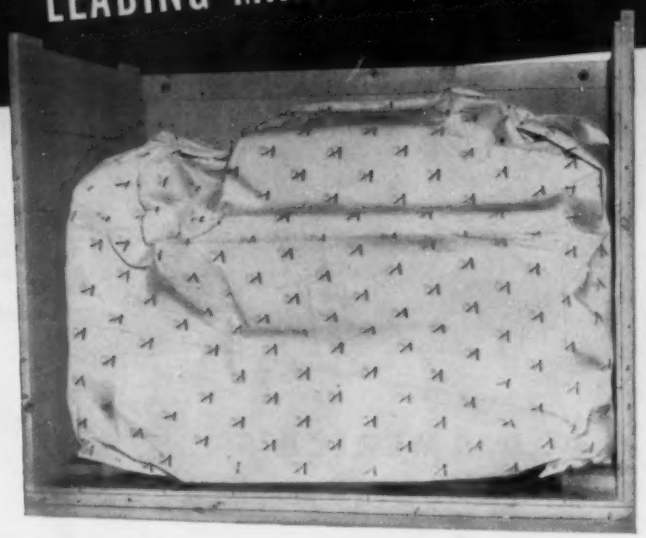

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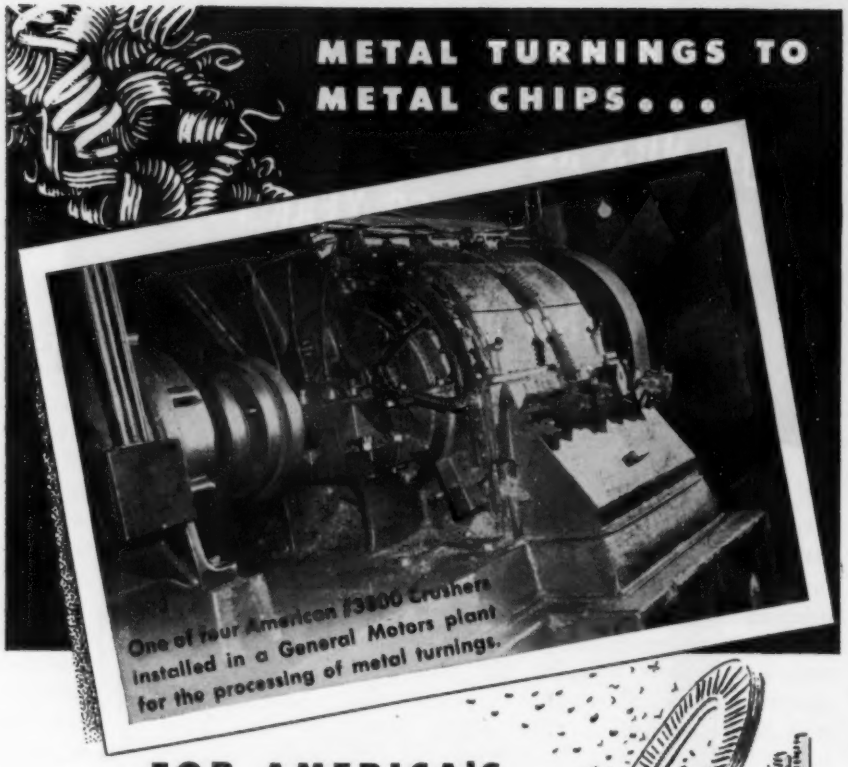
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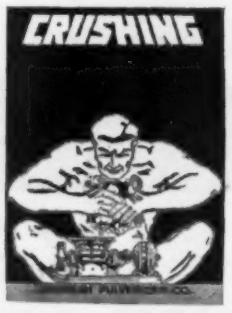

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prescribed by the earnings standard, it may receive an increase exceeding the unit costs of producing a "loss" item.

It is also possible for a company to get an average percentage adjustment for all commodities in a product line, if it chooses this alternative.

Coal Dealers Given Price Raise

Increased ceiling prices, with a maximum hike of 20¢ per ton, now may be charged by retail coal dealers.

Government price-setters authorized the increase to compensate dealers for the higher freight rate allowed transporters by Interstate Commerce Commission, effective May 2. Retail coal industry earnings are too small, Office of Price Stabilization said, to allow absorption of any rate increase.

OPS is making an industry survey to determine if dealers can qualify for further ceiling increases under the earnings standard formula.

The current heightening of price, effective May 24, was specified in Amendment 6 to Supplementary Reg. 2, Revision 1, to the General Ceiling Price Reg. This action allows for automatic pass-through of any future increases in transportation costs which may be permitted by ICC or state regulatory bodies.

Copper, Brass Mill Quotas Issued

National Production Authority said last week it has issued third-quarter allotments for 374,000 tons (metal weight) of brass mill products, 196,000 tons (copper content) of copper wire mill products, and 170,000 tons (metal weight) of foundry products.

It estimated that 354,000 tons of refined copper, along with 197,000 tons of copper scrap, would be needed to take care of authorized orders at mill and foundry levels.

The agency said it expected the attrition rate at the mill level and failure to cash tickets for one reason or another, to run about 10 pct of the total product tonnage authorized.

DTA Asks Steel for Lakes Ships

Defense Transport Administration, in addition to claiming fourth quarter materials to continue the Great Lakes shipbuilding program, will seek about 2000 tons of carbon steel for new starts.

The agency is claiming sufficient allotments of fourth quarter materials to continue work on 168 vessels of varied types for inland waterways as well as for new starts on 112 others.

GRS Export Quotas Lifted

Commerce Dept. has removed quota restrictions from exports of government - produced synthetic (GR-S) rubber together with an abolition of quarterly deadlines for filing license applications.

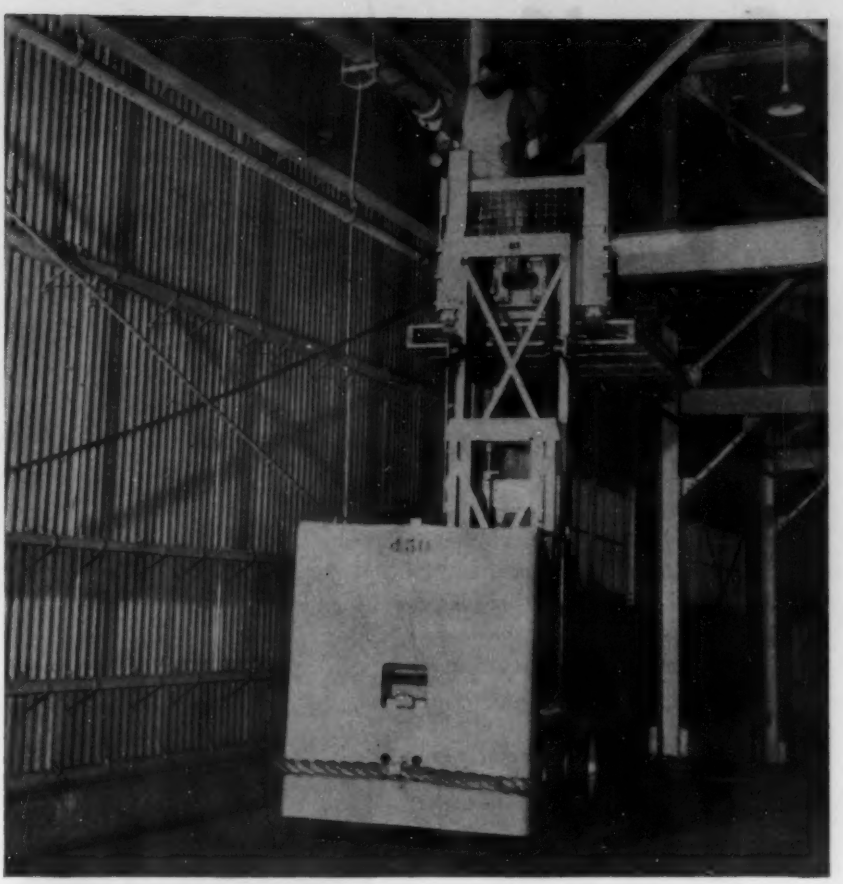
However, restrictions on purchases of dry cold GR-S under National Production Authority's M-2 still apply to exporters as well as to domestic purchasers.

Tinplate Export Filing Date Set

Third-quarter filing period for licenses to export secondary tinplate products has been set for June 2-30.

The filing period for fourth quarter applications to export specification production tinplate has been established as June 16 through July 18.

"My last job left me — I worked in a munitions plant. It blew up."



Material Handling plus Maintenance

This industrial truck, regularly employed for handling material in unit loads of 2000 to 4000 pounds, serves also to save time on many kinds of plant-maintenance jobs.

It is powered by a 28-cell D8 EDISON Nickel-Iron-Alkaline Storage Battery assembled in a demountable steel box, rated capacity 20.16 kwhr, which has been found ample for full-shift truck operation. Exchanging batteries at the end of one shift, gives the truck operating power for the next shift.

The battery is charged from current produced wholesale by a central station—the lowest cost power obtainable. In combination with a high-torque electric motor, it gives the truck an instant flow of power for starting and acceleration, yet is instantly and completely off during the many momentary pauses between the forward, back, up, down, and tilting motions of the truck while engaged in picking up, carrying, tiering and setting down loads.

The electric-motor drive is just as dependable and trouble-free as in stationary-machine drives. The battery, its cells made of steel, its alkaline electrolyte a preservative of steel, its principle of operation foolproof, is the longest-lived, most trouble-free of all types of storage batteries. Send for our bulletin *Modern Material Handling* for more information on the advantages of the unit-load method of handling material, the power requirements of industrial trucks and the characteristics of EDISON batteries. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. Thomas A. Edison of Canada, Limited, Montreal.

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EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES

Specify PERKINS custom-made GEARS *for trouble-free power transmission*

One of the important factors which contribute to the consistent high quality of PERKINS GEARS is our modern heat-treating department—a section of which is shown below. At right is the Leeds-Northrup control panel which insures accuracy of temper.

PERKINS MAKES TO CUSTOMERS SPECIFICATIONS IN ALL MATERIALS, METALLIC & NON-METALLIC:

bevel gears, ratchets, ground thread worms, spiral gears, worm gears, helical gears, spur gears with shaved or ground teeth.

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the PERKINS PRECISION SPRING COILER

This patented spring coiler turns out precision springs of any type, shape or size from wire sizes .005 to .125. Complete data and prices upon request.

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Controls

End of Crucible Ceilings Sought

Suggestions by graphite crucible manufacturers that price controls be removed from their products are getting sympathetic treatment at the Metals Branch level, Office of Price Stabilization. What top OPS officials think of these ideas remains obscure.

The case presented by industry spokesmen is this: Manufacturers are in a price squeeze because of higher costs of imported raw materials, a climb in domestic freight rates, and increased labor costs. If controls were lifted competitive practices would keep upward price adjustments at a minimum.

Use of the earnings standard as a basis for seeking higher prices was suggested, but producers said it would be difficult to apply.

Sales volume in their business now is at the rate of about $6 million per year. Because of this figure, producers believe a rise in product prices would have a very minor effect on costs of processing metals.

OPS to Clarify Price Procedure

Official clarification of the relationship between resellers' ceiling prices and manufacturers' historic list prices for industrial supplies, tools, and equipment will be issued soon by Office of Price Stabilization.

Agency personnel made this promise recently to spokesmen for the nation's industrial supply distributors. The latter had told OPS that it would be advisable to clear up confusion resulting when resellers attempt to determine prices for industrial and production machinery under Ceiling Price Reg. 67.

The same resellers also deal in iron and steel products priced under CPR 98.

SSB Interpretations Available

Interpretations 6, 7, and 8, newly issued by Office of Salary Stabilization contain information on extended workweek pay, stock option and stock purchase plans, and effects of changes in legal structure of business enterprises.

International

World Increase:

Steel importers go into business for themselves . . . S.A. paces way.

Establishment and expansion of iron and steel production capacities is the current trend among nations usually regarded as importers of these materials, reports the International Labor Office.

This tendency is particularly marked in South America. Chile set up the second largest plant in South America in 1950 and will soon be an important exporter. Columbia started from scratch and is expected very shortly to have a steel output of 100,000 tons per year. Peru is following suit, while Brazil, the leading South American steel producer, has set a goal of 1 million tons a year by 1953.

Middle East Expands—Turkey went into the steel business during the war and is now pacing the Middle East with a planned iron output of 350,000 tons and a steel production rate of 220,000 tons. Egypt has blueprinted plans for a 150,000-ton steel industry.

China looms as an important producer with rebuilt plants.

In the Pacific, the Philippines have laid the groundwork for a 150,000-ton steel capacity. Efforts have been made to establish a powerful iron and steel industry in Red-controlled East Germany, and Rumania hopes to raise its steel output to 1,250,000 tons annually by 1955.

"Was that 80B35 you wanted out of No. 3 furnace, Mr. Truman?"

Sub-surface defects are quickly discovered with the Sperry Reflectoscope in the Grumman Aircraft Engineering Corp. plant.

SPERRY ULTRASONICS

INSURE QUALITY AND SAFETY

Large aluminum alloy forgings being tested after partial machining.

Critical areas of stress fittings being sonic tested.

Without quality there is no safety wherever metal parts are under stress. To insure the high quality of all components Grumman Aircraft Engineering Corporation uses Sperry Reflectoscopes to test raw materials and manufactured parts used in their famous planes.

The Sperry Ultrasonic Reflectoscope is the most modern non-destructive instrument for on-the-spot testing of metals for the detection of defects. Not only are many hours of machining saved but manufacturers are assured that no hidden flaws exist to cause later failure.

Practically every type of metal can be quickly and accurately inspected with the Sperry Reflectoscope. Parts may be checked without dismantling at great time saving to industry.

Write for complete descriptive information on the Sperry Day-to-Day Inspection Service or ask for particulars covering the lease or sale of the Sperry Ultrasonic Reflectoscope.

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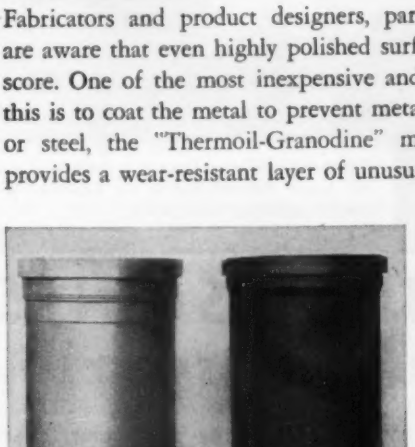
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: PROTECTING FRICTION SURFACES WITH THERMOIL GRANODINE®

INTRODUCTION

Fabricators and product designers, particularly in the automotive field, are aware that even highly polished surfaces under friction weld, gall and score. One of the most inexpensive and practical methods of preventing this is to coat the metal to prevent metal-to-metal contact. With cast iron or steel, the "Thermoil-Granodine" manganese-iron phosphate coating provides a wear-resistant layer of unusual effectiveness.



Thermoil-Granodizing greatly prolongs the life of parts subject to friction. It protects the surface of products like the diesel engine liners shown above and the many moving parts of automobiles and other machines. "Thermoil-Granodine" with its remarkable lubricating properties is particularly valuable in these and similar applications because of its ability to retain oil and maintain lubrication under high pressures and high velocities. This ACP wear-proofing chemical not only permits rapid break-in without scoring, scuffing and welding but also reduces subsequent wear on friction parts.

"THERMOIL-GRANODINE" PROTECTS RUBBING PARTS

Thermoil-Granodizing removes "fuzz" from ferrous metal friction surfaces and produces a coating of non-metallic, water-insoluble manganese-iron phosphate crystals which soak up and hold oil as bare untreated metal cannot do. The oiled crystalline "Thermoil-Granodine" coating on piston rings, pistons, cylinders, cylinder liners, cranks, cam-shafts, gears, tappets, valves, spiders and other rubbing parts, allows safe break-in operation, eliminates metal-to-metal contact, maintains lubrication and reduces the danger of scuffing, scoring, welding, galling and tearing of the metal. The work to be protectively treated is merely Thermoil-Granodized and oiled, usually with a soluble oil.

"THERMOIL-GRANODINE" MEETS THESE SPECIFICATIONS

SPECIFICATION NUMBER	SPECIFICATION TITLE
MIL-C-16232 Type I	Coatings — phosphate; oiled, slushed, or waxed (for ferrous metal surfaces) and phosphate treating compounds.
AN-F-20 (See also U.S.A. 3-213)	Finishes, for electronic equipment.
U.S.A. 57-0-2C Type II, Class A	Finishes, protective, for iron and steel parts.
U.S.A. 51-70-1 Finish 22.02, Class A	Painting and finishing of fire control instruments; general specification for
M-364	Navy aeronautical process specification for compound phosphate rust-proofing process.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "THERMOIL-GRANODINE" AND ON YOUR OWN METAL PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

Defense Contracts

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Commanding Officer, Watertown, Mass.
Cylinders gas oxygen, 14500 ea, 52-214B, May 29.

Detroit Arsenal, Centerline, Mich.
Elbow assy packing glad nominal size ¾ in., 1095 ea, 52-280B, June 6.

Yards and Docks Supply, Porthueneme, Calif.
Heater, steam, 950 ea, YDSO-1091-52, June 3.
Pontoons T-6B, assembled, Navy nr. C8-p-130, 11400 ea, YDSO-117-52, June 13.

Corps of Engineers, Atlanta.
Prefabricated metal bldg. knockdown type, item, 310B, June 10.

Corps of Engineers, Philadelphia.
Extinguisher, fire, 13922, Eng-36-109-52-622B, May 20.

Corps of Engineers, Chicago.
Crane, cruiser, single eng, 23 ea, B-485B, June 2.
Mower, tractor drawn, cutter, bar type, 46 ea, A-515B, June 2.

Ordnance Tank Automotive Center, Detroit.
Switch assy, foot dimmer, 100000, 52-3784B, June 6.
Retainer, oil service brake shoe anchor pin, 30000, 52-3700B, June 6.
Bearing, frt spring, eye, 70000, 52-3753B, June 6.
Pulley gen. drive, 20000, 52-3615B, June 6.
Truunion, 1700, 52-3413B, June 3.
Shaft lever steering gear, 40000, 52-3701B, June 6.
Gear sliding low and reverse, 18000, 52-3610B, June 4.
Bearing eng cyl hd valve, 5300, 52-3742B, June 10.
Shoe brake rear w/lining, 120,000, 52-3650, June 5.
Kit repair steering drag link mfrs, 25000, 52-3742B, June 10.
Jacket w/bearing, 27500, 52-3742B, June 10.
Bearing bushing, 100000, 52-3820B, June 4.
Collar hoist cyl, 3000, 52-3688B, June 4.
Cover side power take off, 13000, 52-3756B, June 10.
Gear intermediate shaft, 5000, 52-3756B, June 10.
Shaft power take off, 9000, 52-3756B, June 10.
Link winch brake shoe, 4000, 52-3717B, June 7.
Gasket, exhaust pipe, 10000, 52-3865B, June 11.
Bushing, piston pin, 35000, 52-3738B, June 11.
Screw, mach. 266,000, 52-3009B, June 9.
Cabinet tool and spare parts metal type, 9430, 52-3746B, June 4.
Stud transfer shaft bearing, 12500, 52-3803B, June 4.
Stud rear axle spur, 10000, 52-3803B, June 4.
Clip, 163000, 52-3317B, June 10.

Springfield Armory, Springfield, Mass.
Sight rear group assy, 14000 ea, 52-308B, June 3.
Screw set rear sight base, 20000 ea, 52-308B, June 3.
Screw rear sight windage scale, 20000 ea, 52-308B, June 3.
Slide rear sight 36000 ea, 52-308B, June 3.
Leaf rear sight assy, 40000 ea, 52-308B, June 3.
Shield forearm, 35000 ea, 52-308B, June 3.
Blade front sight, 2700 ea, 52-308B, June 3.
Spring rear sight base, 20000 ea, 52-308B, June 3.
Tube gas cylinder, 68000 ea, 52-311B, June 4.
Sleeve stock retaining assy, 36000 ea, 52-311B, June 4.
Tube buffer, 18000 ea, 52-311B, June 4.
Tube with cap, 20000 ea, 52-311B, June 4.
Plunger, extractor spring, 115000 ea, 52-302B, May 29.

General Services Administration, Washington.
Fittings, pipe elbow, var sizes, 10000 ea, 3K-12555-R, June 2.

Chicago Quartermaster, Chicago.
Heater immersion, 8372 ea, 52-1534B, June 4.

Contracts Reported Last Week

Including description, quantity, dollar value, contractor and address:

Tank, steel, hot water storage, 284, $45,979, Stover Steel Tank & Mfg. Co., Freeport, Ill.

Tank, steel, hot water storage, 970, $95,952, John Wood Co., Conshohocken, Pa.

Truck, fire powered pumper, 219, exceeds $250,000, Hesse Carriage Co., Kansas City.

Spare Parts, Job, $54,229, Walter Kidde & Co., Belleville, N. J.

Spare Parts, Job, $60,434, Electric Supply Corp., Chicago.

Spare Parts, Job, $70,083, Ralph B. Carter Co., Hackensack, N. J.

Spare Parts, Job, $91,402, John Reiner & Co., Long Island City, N. Y.

Tank-Automotive Spare Parts, $139,301, General Motors Corp., East Pontiac, Mich.

Case, Cartridge, 1,400,000, $3,962,000, Servel, Inc., Evansville, Ind.

Container, Ammo, 3,609,000, $347,727, The Heekin Can Co., Cincinnati.

Casing, Burster, 309,000 ea, $244,110, Arndt Metalcraft Corp., Trenton, N. J.

Turrets and Weldments, 344, $1,203,140, General Steel Castings Corp., Eddystone, Pa.

Grenade, Hand, Practice, $322,944, Richmond Foundry & Mfg. Co., Richmond, Va.

Mortar, 4.2, M30 with mount, 1282 ea, $1,790,505, Whirlpool Corp., St. Joseph, Mich.

Heat metal parts assy for rocket, 400,000, $836,000, United States Steel Co., Pittsburgh.

Spare Parts, $1,095,581, Jacobs Aircraft Engine, Pottstown, Pa.

Spare Parts, $218,098, Fluid Power, Inc., Macedonia, Ohio.

Spare Parts, $1,415,905, Aro Equipt Corp., Bryan, Ohio.

Propeller Assys, $468,007, Curtiss-Wright Corp., Caldwell, N. J.

Tank and combat vehicle parts, 4752, $162,328, General Motors Corp., Flint, Mich.

Metal parts for shell, 300,000, $5,684,400, L. A. Young Spring & Wire Corp., Detroit.

Range finder, 2 sets, $110,279, General Motors Corp., Detroit.

Tractor, crawler, 64 ea, $223,987, International Harvester Co., Melrose Park, Ill.

Tractor, med, 50 ea, $956,299, International Harvester Co., Melrose Park, Ill.

Cranes, cruiser, 25 ea, $447,625, American Steel Dredge Co., Inc., Fort Wayne, Ind.

Spare parts for Amer. Bosch Corp. Equip., var, $128,128, American Bosch Corp., Springfield, Mass.

Spare parts for equipt, var, $78,834, Atlas Chain & Mfg. Co., Phila.

Spare parts for equipt, var, $100,830, Link-Belt Speeder Corp., Cedar Rapids, Iowa.

Spare parts for equipt, var, $2,234,353, Caterpillar Tractor Co., Peoria, Ill.

Case, cartridge, 105mm, exceeds $250,000, Morris-Thermador Corp., Vernon, Calif.

Metal parts for booster, exceeds $250,000, Cleary Multiplier Corp., San Gabriel, Calif.

Metal parts for fuze, rocket, exceeds $250,000, Harvey Machine Co., Inc., Torrance, Calif.

Tank, steel, vertical, bolted, knockdown, exceeds $250,000, The Parkersburg Rig & Reel Co., St. Parkersburg, W. Va.

Tank, steel, vertical gas and oil, exceeds $250,000, Black Sivall & Pryson, Inc., Kansas City.

Tank, steel, vertical gas and oil, exceeds $250,000, Butler Mfg. Co., Kansas City.

Tank steel, vertical gas and oil, exceeds $250,000, Columbian Steel Tank Co., Kansas City.

Heater, water, steel, 100, $79,857, Dewey-Shepard Boiler Co., Inc., Peru, Ind.

Tank, steel gas and oil, exceeds $250,000, Black, Sivalls & Bryson, Inc., Kansas City.

Extinguisher, fire, 1550, $46,872, The General Detroit Co., Detroit.

Heater, air, 160, $57,008, Anchor Post Products, Inc., Baltimore.

Spare propeller shaft assys, 25, $637,500, Erie Forge & Steel Corp., Erie, Pa.

THE MOST NEWS
and
THE BEST NEWS

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FOR A MINUTE AND A PENNY

Does your job involve small, precision spur gears? Would you like to produce them fast?

Whether your work calls for long production runs or frequent set-ups, you need to know about the Hamilton No. 00 Precision Spur Gear Hobber. Spend a minute now to send your request for a copy of our Bulletin No. H-00-49. Acquaint yourself with this efficient tool, and be ready for the challenge ahead.

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Those moves of material "up" — "down" — "in" — "out" — "across" and "back" can't be avoided — but their cost can be minimized.

It's largely a matter of proper selection of cranes, hoists, etc., as to type, construction, cost of operation, freedom from repairs, etc.

We've built these types of equipment for several decades but we are regarded by our customers as material handling "consultants." We'll welcome an opportunity to discuss your problems. Doubtless there's a Euclid crane or hoist to handle the situation in an ideal manner.

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Construction

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

3759 **Tons,** Boston, steel superstructure for elevated highway. Mt. Vernon Bridge Co., Mt. Vernon, Ohio, is low bidder.

3570 **Tons,** Philadelphia, main hospital building for Eastern Pennsylvania Psychiatric Institute, John McShaine, same city, low bidder.

2066 **Tons,** Boston, deck, electrical work and snow melting system for double and single deck elevated highway structure, Charles River Bridge to Oliver St. V. Barletta Co., Rosindale, Mass., low bidder.

930 **Tons,** Beaumont, Tex., water plant and boiler room for Gulf States Utilities through Stone and Webster Engineering Corp., Inc., to Orleans Material and Equipment Co.

900 **Tons,** New Cumberland, Pa., Warehouse No. 85, New Cumberland Army Depot, Corps of Engineers, Brotherton Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem.

380 **Tons,** Philadelphia, Bldg. No. 44, Frankford Arsenal, to Bethlehem Fabricators, Bethlehem.

235 **Tons,** Salem County, N. J., swing-span bridge for New Jersey State Highway Dept., Arthur T. Henry, Atlantic City, low bidder.

Fabricated steel inquiries this week include the following:

555 **Tons,** Lehigh, Northampton Counties, Pa. Divided highway, concrete pavement, two girder bridges, one I-beam bridge, service roads, ramps. Pennsylvania State Dept. of Highways, Harrisburg, Pa. Bids to June 6, 1952.

416 **Tons,** Luzerne County, Pa., widening of pavements, deck plate girder bridge, reinforced concrete bridge. Pennsylvania State Dept. of Highways, Harrisburg, Pa. Bids to June 6, 1952.

159 **Tons,** Rumford and Mexico., Me., structural steel bridge.

145 **Tons,** Damariscotta and Newcastle, Me., structural steel bridge over Damariscotta River.

Reinforcing bar inquiries this week include the following:

445 **Tons,** Boston, construction of an underpass and roadway at Charles St. between Poplar and Lowell St., in West End.

187 **Tons,** Hopkinton, Mass., two span concrete solid section rigid frame bridge.

155 **Tons,** Luzerne County, Pa., widening of pavements, deck plate girder bridge, reinforced concrete bridge. Pennsylvania State Dept. of Highways, Harrisburg, Pa. Bids to June 6, 1952.

111 **Tons,** Lehigh, Northampton Counties, Pa. Divided highway, concrete pavement, two girder bridges, one I-beam bridge, service roads, ramps. Pennsylvania State Dept. of Highways, Harrisburg, Pa. Bids to June 6, 1952.

Construction Awards on Upswing

April construction contract awards for 37 states East of the Rockies totaled $1,597,517,000, perking up the 1952 building pace. The April figure represents a 21 pct increase over March and a 16 pct jump over April '51. However, 4-month 1952 total of $4,706,068,000 is still 2 pct below comparative 1951 rate, reports the F. W. Dodge Corp.

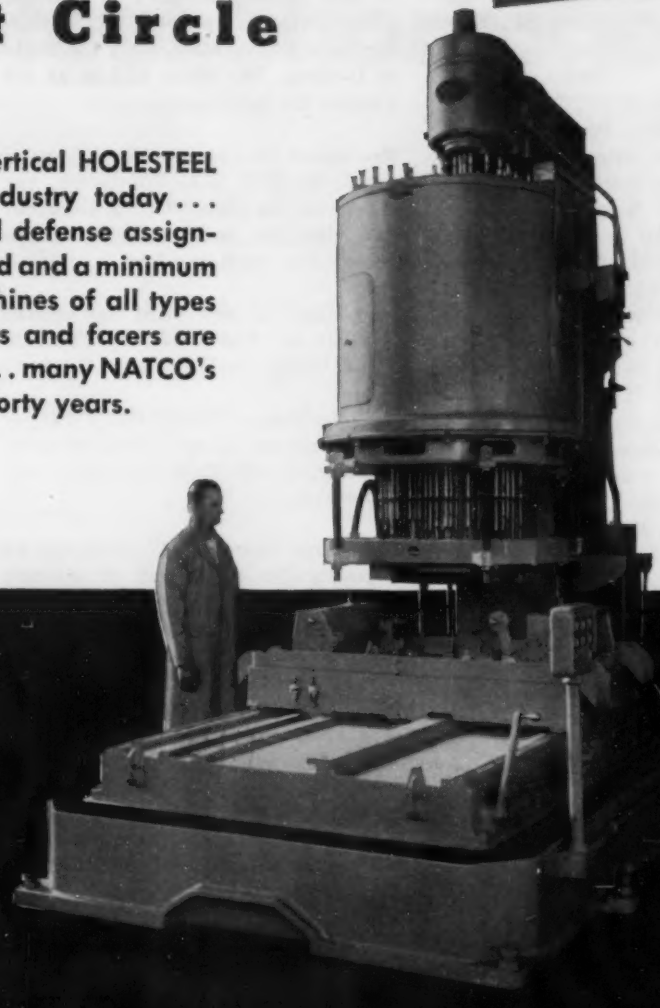
Public and private works and utilities contracts awards in April of $353,647,000 proved the greatest increase.

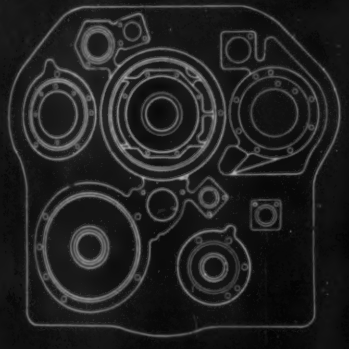
MAMMOTH NATCO

Drilling 50 Holes on 36″ Bolt Circle

Natco Engineered for Quality Production

NATCO Model C4B Vertical HOLESTEEL drillers are at work for industry today . . . doing tough peacetime and defense assignments with a maximum speed and a minimum of down time. NATCO machines of all types . . . drillers, borers, tappers and facers are veterans of years of service . . . many NATCO's are now in operation over forty years.





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Industrial Briefs

New Offices—ARTCO INDUSTRIAL CO., INC., has moved to new and larger offices at 50 Church St., New York.

Order Received — WESTINGHOUSE ELECTRIC CORP., Pittsburgh, has been awarded an order for approximately $9 million worth of electrical equipment from Kaiser Engineers, Oakland, Calif., for four new potlines at the Chalmette aluminum reduction plant of Kaiser Aluminum & Chemical Corp. These lines will give the plant a total of eight potlines and will double the plant's capacity.

New Building — Sometime in June construction is expected to be completed on a new concrete building at the West Allis Works, ALLIS-CHALMERS MFG. CO., Milwaukee, to house a 22-million-volt betatron.

Work Completed — A new one-story unit adding 17,000 sq ft to the present structure of EASTERN BRASS & COPPER CO., 1122 East 180 St., Bronx, N. Y., has been completed.

Land Bought—LEEDS & NORTHRUP CO., Philadelphia, have bought a 125-acre tract at North Wales, Pa.

Committee Formed—A Junior Management Committee to guide operational policies and management of its steel warehousing and manufacturing business has been formed by the HORACE T. POTTS CO., Philadelphia.

International Library—Recently William H. Worrilow, Sr., president of the Lebanon Steel Foundry, Lebanon, Pa., spoke at the dedication of an INTERNATIONAL LIBRARY in Schaffhausen, Switzerland. The library is devoted to the history of iron and steel.

Visits Europe—Al Curry, president of ALBERT CURRY & CO., INC., Pittsburgh, left May 27 for an extended visit to Europe, where he will call on steel producers in Belgium, France, Italy and Germany.

Safety Award—The Archer Chicago plant of ACME STEEL CO., received their third consecutive first-place safety award for industrial injury prevention.

Representative Appointed — THE STEEL IMPROVEMENT & FORGE CO., Cleveland, appointed C. S. Markee sales representative for the State of Indiana. His offices will be at 110 East 51 St., Indianapolis.

Mechanism Developed—KEARSARGE TOOL & MFG. CO., Pittsburgh, has developed the Squar-Up, a combination vise and angle plate with two independent clamping jaws.

New Plant—A new plant was opened recently by The UNITED STATES TIME CORP., in Waterbury, Conn.

New Building—CHAIN BELT CO., is now occupying its new administration building, at 4701 West Greenfield Ave., Milwaukee.

Certificate Granted—A certificate of necessity for production of aircraft tubing has been granted the PACIFIC TUBE CO., Los Angeles, and the company plans an immediate expansion.

New Warehouse—The Aluminum Div., ATLANTIC STEEL & IRON CO., Springfield, Mass., has opened its new warehouse.

Expansion Completed—Expansion of its rubber roll covering facilities has been completed by the QUAKER RUBBER CORP., Div. of H. K. Porter Co., Inc., Philadelphia.

WINNER: John S. Marsh, left, research engineer, Bethlehem Steel Co., receives the American Iron & Steel Institute's medal from the organization's president, Walter S. Tower, at the annual meeting in New York last week.

Building Project—Recently a large Air Force building project was completed at Donaldson Air Force Base, South Carolina. It consists of 121 prefabricated steel buildings, the majority of which were manufactured by ARMCO DRAINAGE & METAL PRODUCTS, INC., Middletown, Ohio.

New Plant—Construction of a 90,000-sq-ft permanent magnet manufacturing plant was started recently in Edmore, Mich., for the Carboloy Dept., GENERAL ELECTRIC CO. The new plant will house complete manufacturing facilities and will provide room for future expansion and new processing operations.

Move Scheduled—Eleven manufacturing departments and the supporting service departments of PRATT & WHITNEY AIRCRAFT, required to maintain production operations are scheduled to move into the new North Haven, Conn., branch plant this summer.

New Department—A new West Coast Parts & Service Dept. will be opened June 1st by the Communications & Electronics Div., MOTOROLA, INC.

Steel Plants—German manufacturers have been given the contract to build a steelworks for the EGYPTIAN GOVERNMENT. It will be erected at Aswan, and will have an annual capacity of 160,000 metric tons of crude steel. Japan has made an offer to India to build a steel plant while the Krupps Works, Germany, has put in a bid for a blast furnace in India.

Symposium—A 2-day SYMPOSIUM on metal cutting will be held June 4 and 5 in connection with the dedication of the Sloan Metal Processing Laboratory at Massachusetts Institute of Technology. The Symposium will follow the dedicating of the $1 million Sloan Metal Processing Building made possible by a gift from Alfred P. Sloan, Jr., chairman of the board of General Motors.

Work Begun — The SEIDELHUBER STEEL ROLLING MILL CORP., Seattle, has started foundation work on a $5 thousand, 24-in. steel plate and billet mill in Seattle. The mill will produce 5000 tons of plate each month, and will employ 50 men.

2 ways to ease your Steel Shortage

1 Collect all dormant Steel Scrap and get it to the steel producers

Millions of tons of valuable scrap still lie idle in America. Scrap salvage means more production—a stronger America. Clean out your plant . . . sell all your iron and steel scrap to your local scrap dealer now. The need is urgent. Every bit will help to meet the needs of defense production.

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TO YOUR SCRAP DEALER

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N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

NATIONAL STEEL

Improvement Hike, BLS Loss=3c Per Hr

June 1 to bring escalator clause wage loss of 1¢ per hr . . . Improvement factor hike at same time is 4¢ for 3¢ net gain . . . Chevrolet rushes plant for war work—*By R. D. Raddant.*

The approach of June 1 and a new set of price indices from the Bureau of Labor Statistics once again throws the spotlight on automotive wages and the famous escalator clause.

The regular quarterly evaluation of prices is complicated this time by a simultaneous "annual improvement factor" raise that will be granted 1 million automobile workers June 1.

It now appears that the auto worker will get 4¢ per hr more from "improvement factor" increases. At the same time, he will sustain a 1¢ cut from a slumping price index. Auto workers' wages rise or fall under the escalator clause with each 1.14 pct rise or fall in living costs as measured by the BLS nationally. Revisions occur at the end of each quarter. Total effect is a 3¢ raise.

24¢ So Far—How does this stack up over the long term? Under UAW escalator contracts, auto workers have received a total of 24¢ an hr in cost of living adjustments since this wage plan was begun at General Motors in 1948 and adopted in 1950. Contracts still have 3 years to run.

Some labor relations people have expressed concern that the more dramatic pay struggle now going on in steel could have an adverse effect on labor sentiment toward the escalator clause. But this appears to be a pessimistic view.

Jealous of Steel?—It does not mean that when the contract expires there will be a softening of bargaining techniques in negotiating a new one. It would be only human nature if there wasn't some jealousy over a fat steel pay raise. This isn't the most opportune time for even the 1¢ drop.

In general, however, auto workers appear to favor the escalator type of agreement and a long period of comparative labor peace seems to be just as welcome to the average man on the assembly line as to top management.

Mowing the Way—Defense plant production runs on a tight schedule. Pressures to meet the schedule are terriffic. But at the same time the fast pace saves valuable time in vital defense production.

A good example is the schedule followed by Chevrolet in building a million-sq-ft manufacturing plant at Flint, Mich., which will eventually be used for aircraft engine production.

Ground was broken Nov. 30, 1951, with corn pickers mowing down rows of corn in the field outside of Flint just ahead of contractors' bulldozers starting work on the structure.

Quickie Railroad—Now structural steel is delivered on a spur of the Grand Truck Railroad on cars following right behind track laying crews. Two weeks ago, a locomotive stood by the plant site with cars loaded with rails. In 1 week the track was laid to the unloading dock alongside the foundation. With the line ballasted, steel immediately began to move.

T. H. Keating, Chevrolet general manager, announced that excavations and substructures were completed in 5½ months. Manufacturing is set for early '53.

Output Comeback—Detroit is struggling back on its production feet after some extremely hard blows in the first months of the year. Because of production cutbacks and a scarcity of defense work, Detroit remained as a critical unemployment area for several months. Paychecks dropped, profits slumped, and only unemployment benefits rose.

Now unemployment has dropped from 120,000 in December to about 70,000 at the end of April. Secretary of Labor Maurice J. Tobin called the job gains in Detroit the most spectacular in the country.

Removal of the area from the distress classification also has its drawbacks. In Class 4, Detroit contractors could get defense business by matching the bid of a low bidder in a non-critical area. Now bidding is back on a free competitive basis. Detroit still remains in Class 3, one notch better than the distress category.

K-F Merger Talk—In Reno, Nev., where separation talk is the rule, a lot of merger talk was heard last week. The occasion was the annual meeting of stockholders of Kaiser-Frazer Corp.

Turn Page

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
May 24, 1952	99,244*	29,144*	128,388*
May 17, 1952	101,489	28,425	129,914
May 26, 1951	122,990	35,269	158,259
May 19, 1951	122,331	33,796	156,127

*Estimated

Source: *Ward's Reports*

Edgar F. Kaiser, company president, reported that on the basis of production and sales forecasts, K-F will show a profit during 1952, the first in the company's 7-year history.

He also reported that merger talks with Consolidated Vultee Aircraft Corp. and the Atlas Corp. will continue.

Talks Go On—Financial, legal, and operational difficulties are great, but Floyd B. Odlum, president of Atlas and chairman of the board of Consolidated, has asked that discussions continue. One group of stockholders also pressed for a merger with highly profitable Kaiser Aluminum.

Mr. Kaiser's eagerness to announce the possibility of a profit is understandable. In the company's short existence, there has been an unbroken stream of red ink on the ledger book. Sales increases and aircraft production may do the trick this year. The company intends to expand employment at Willow Run from 16,000 to 24,000.

Hudson Has New Carburetion

Hudson is showing off a new high efficiency carburetion system that is designed to boost combustion efficiency and improve responses in lower gears and in high gear at slow speeds.

Called the Twin H-Power, it will be optional equipment for the Hudson Hornet, Wasp, and Commodore Six. The new system measures and distributes accurately gasoline to each cylinder. The desired effect is to increase acceleration and sustain the flow of power through all driving ranges.

In the news in another respect, Hudson announced that its light passenger car will make its appearance in August or early September. Specific details of the car were not announced, but it will be in the lower price field. It will be of the Hudson "step down" design.

FOUNDRY: Electronics Analyze Alloys

Ford plant in Cleveland uses electronic analysis of metal alloys . . . Swift determination of composition . . . Use spectrochemistry . . . Analyzes scrap, molten metal, even parts.

The top possible degree of mechanization is being employed at the Ford engine plant and foundry in Cleveland. The latest development is electronic analysis of metal alloys that go into the different car parts.

With these so-called "electrical chemists," Ford metallurgists determine quickly and accurately the composition of metal alloys. The instruments employ the principles of spectrochemistry, but do the steps automatically. The results are recorded on dials, not on photographic plates, which are usually employed.

Quick Analysis—Ford has three of these instruments, one of which is in use at Cleveland. It can be used for immediate analysis of molten metal taken from foundry furnaces. This makes possible instant corrections if it is not exactly required. Control of quality thus becomes more exact.

The instrument also analyzes scrap metal before it goes into furnaces. Samples of parts can also be checked for quality with a minimum of delay.

The metal to be analyzed is exposed to a 25,000 volt spark which immediately sets it ablaze. The ultraviolet light of each burning ingredient, such as silicon, manganese, chrome, or molybdenum, is sorted by the optical instrument and picked up by photo-electric tubes which record it on dials on the face of the instrument. Technicians then know a metal's ingredients.

THE BULL OF THE WOODS — By J. R. Williams

OW! ME SHIN! TWO HOURS A STRUCTURAL WORKER TO DO FIFTEEN MINUTES' MACHINIST WORK! OH, WHY DON'T TH' DOCTOR COME?
THAT'S THE TROUBLE WITH A MACHINE LIKE THAT! YOU GET A LOT OF SNAPS-- THEN WHEN YOU GET A LITTLE WORK, IT NEAR KILLS YOU! I'D TAKE STEADY BRICKLAYIN'!
5-30
J.R.WILLIAMS
THE KILLER

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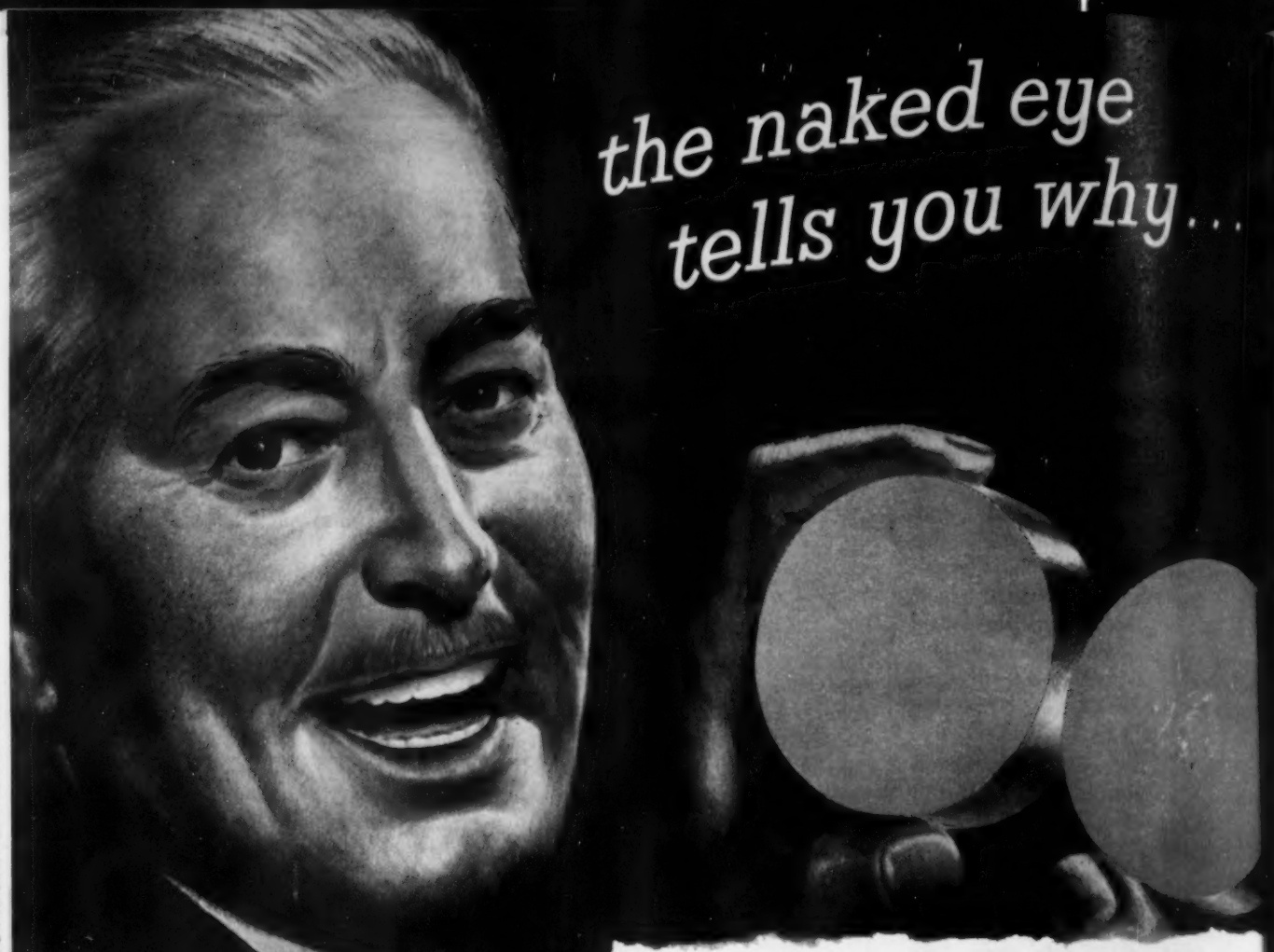

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Who's Right—More Inflation on Way?

Government economists say no but Arnall of OPS warns it's coming when he asks for new, strict price controls . . . Wage Board drops non-wage issue like hot potato—*By G. H. Baker.*

Another burst of general price inflation just isn't in the cards for the balance of 1952, according to government economists.

They predict that varying degrees of recession now being experienced in some civilian lines of production is going to have a definite dampening effect on price rises in the months immediately ahead.

One Washington agency—Office of Price Stabilization—doesn't share this view, however. Ellis Arnall, OPS director, is trying to drum up new interest within Congress for a strict new price control law by claiming he has discovered disturbing signs that the nation is due for a new shot of inflation.

But Horse is Stolen — Wage Stabilization Board, keenly aware of the public disfavor it stirred up by its handling of the steel dispute, is now quietly withdrawing from participation in non-wage matters brought before it for settlement. In the steel dispute it sabotaged bargaining chances with a recommendation for a union shop atop a too-high wage package decision.

Newest example of WSB's belated "let's-stick-to-our-own-knitting" attitude is the board's refusal to be drawn into the issue of whether or not the United Automobile Workers (CIO) should obtain a "multi-plant" or "master agreement" understanding from Borg-Warner Corp.

Shortly after this dispute was referred to WSB in October, 1951, a tripartite board panel recommended that corporation-wide bargaining be enforced upon the company.

Minority Wins—Industry members, however, filed a minority report, stating that corporation-wide bargaining was properly a function of the National Labor Relations Board, that the WSB ought to keep its nose out of this and other non-wage matters.

Last week, the WSB reversed the panel majority, and adopted as its own the views of the industry minority. Behind this flat legal language in the Borg-Warner case lies the board's new and firm decision: "The board declines to issue a recommendation on the issue of the multi-plant agreement without prejudice to the respective rights and remedies of the parties under the Labor Management Relations (Taft-Hartley) Act."

Trouble in the Air—U. S. industrial centers will come face to face with the grim and heightened threat of Soviet air power in about 18 months.

Pentagon strategists, without disclosing the basis of this prediction, point out guardedly that it's reasonable to believe Russia's air and atomic progress has been accelerated by U. S. secrets gained from the Fuchs betrayal and the technical information pirated from Germany.

By mid-1954, it is estimated, the Soviets should have a sufficient number of atomic bombs to sustain an atomic offensive.

"Atomic energy is a young man's field."

Significance—"Sustain" is the key word here, according to Lt. Gen. Thomas D. White, USAF, since it is considered likely that the Soviets already have enough atomic bombs on hand to arm one atomic attack. But today such an attack would probably consume all stocks on hand.

Within 2 years, however, the Red stockpile should be large enough to arm succeeding attacks—if the first attack should fail. And, unless effectively opposed and countered, such an attack could seriously cripple key U. S. centers of productivity.

Manganese Depot — Producers of manganese in the Southwest soon will have a new, centralized government collection depot available to them.

General Services Administration, the government's principal buyer and storekeeper for scarce materials, is preparing to open the new depot at Wenden, Ariz., sometime in June.

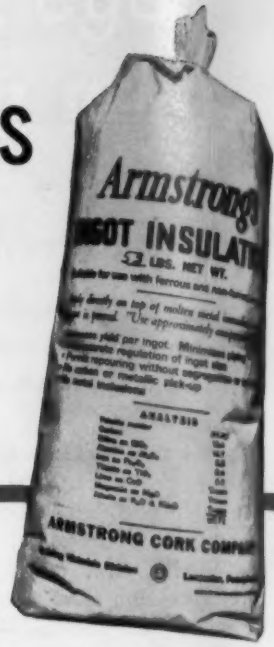
Present GSA plans call for the collection of on-the-spot purchases of manganese at the new depot.

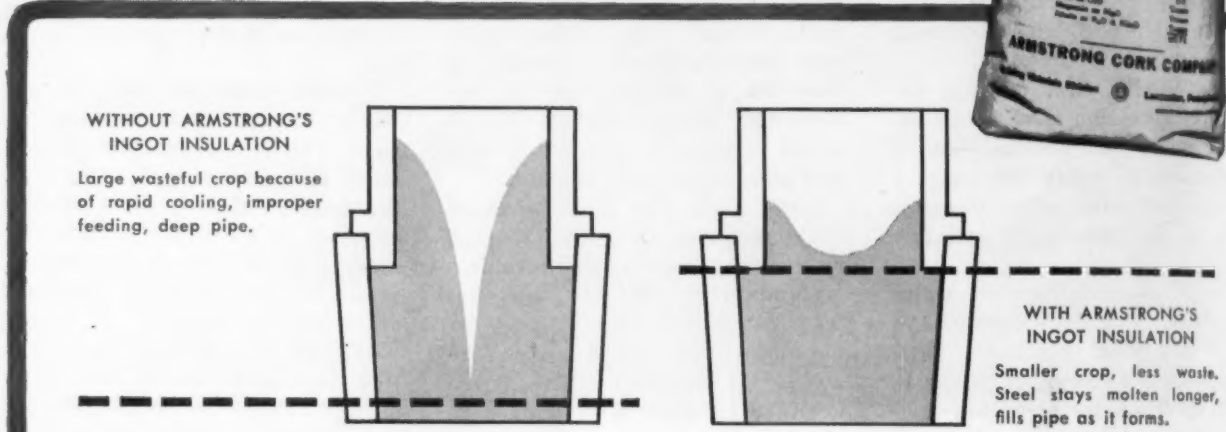
Dissolve Group — Defense Production Administration over the weekend dissolved its distressed areas task force and transferred its functions to the 19 regional defense mobilization committees.

Some of the personnel will be made available on a consulting basis. And Assistant DPA Administrator Eugene F. Bertrand will be the contact man in Washington to get DPA or NPA action.

How to cut INGOT-CROPPING LOSS

20% to 30%!

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Large wasteful crop because of rapid cooling, improper feeding, deep pipe.
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Smaller crop, less waste. Steel stays molten longer, fills pipe as it forms.

You can reduce cropping waste 20% to 30% on every ingot you pour—with Armstrong's Ingot Insulation. This efficient insulating material is composed of carefully graded cork particles coated with special clays. Here's how it works for you to minimize crop loss and boost your steel output:

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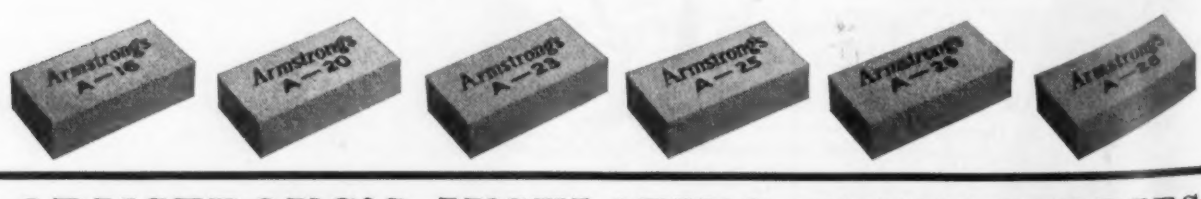
The insulating value of the cork remains effective right through solidification. Protected by the clay coating, the cork particles are not consumed immediately by the molten steel. There's no carbon pickup, no non-metallic inclusions, no alteration of either chemical or physical composition. Any residue of clay or cork remains intact and floats to the surface if the ingot is re-poured.

See for yourself how Armstrong's Ingot Insulation can give you more usable steel per ingot. We'll be glad to send you a free sample or have an Armstrong engineer help you conduct tests right in your own plant. For further information on ingot insulation, just contact your near-by Armstrong office or write direct to Armstrong Cork Company, 3505 Mulberry St., Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

Steel:

Await Supreme Court decision on seizure . . . Court may delay recess.

Absence of any mention by the U. S. Supreme Court early this week to President Truman's seizure of the steel industry raises belief that the high court may postpone its scheduled June 2 adjournment in order to clarify the broad seizure question before its summer recess.

But it is possible that the court may announce its decision in the steel case at any time. As a matter of custom, the court announces its opinions on Mondays. However, important decisions like seizure of the coal mines have in the past prompted the court to convene on short notice on other days of the week for the reading of its opinions.

Ask Congress—President Truman, meanwhile, is preparing to ask Congress for clear-cut legislative backing of his seizure move if the Supreme Court should rule against him. Some government officials believe that Mr. Truman intends to go on ignoring the injunction provisions of the Taft-Hartley Act. In this case, it is expected that he will tell congressmen that it's up to them to legislate specific seizure authority.

Should the high court nullify the present seizure, an immediate strike by Phil Murray's United Steelworkers appears to be a definite prospect.

Steel Dividends Flop in '52

Publicly reported dividends paid by the steel industry for the first quarter 1952 amounted to $102 million as against $197 million last year, according to the Office of Business Economics.

The total reported payments of overall industry to stockholders for the period amounted to $1.9 billion, an increase of $114 million from last year.

The trend upward was by no means general. Dividend payments by the autobile industry showed considerable decrease from last year as did some lines of soft goods.

Biggest rate of increase was shown by the oil industry—about 25 pct. First quarter totals as tabulated by OBE rose from $196 million in 1951 to $240 million—largest total for any industry.

Start Six Smokeless Powder Lines

Production on six smokeless powder lines will start at Indiana Ordnance Works, Charlestown, Ind., by September or October, 1953, according to the Army, which is completing output arrangements with DuPont.

In March, DuPont began to recondition three of these lines. Initial production from the three is expected to begin next month, with maximum production planned for November.

Under a new cost-plus-fixed-fee contract now being written, DuPont will rehabilitate and operate the three remaining lines. Value of the contract is more than $60 million, of which the estimated cost of reconditioning is $21 million.

Initial output from the second three lines is scheduled to start in May, 1953.

"Don't talk to me about labor pirating!"

Bridges:

Aluminum spans tested by Army Engineers will carry combat loads.

Army Engineer teams at Ft. Belvoir, Va., are testing a new series of military bridges, including an aluminum footbridge, an aluminum light tactical bridge for certain combat and supply vehicles, and aluminum and steel floating and fixed bridges for heavier equipment.

Final stages of development have been reached on this series of structures, the Army says, and early procurement of a new railway bridge is planned. Preparation of these bridges, designed to be placed in use more rapidly and carry heavier loads, was dictated by the Army's use of heavier mechanical equipment.

Carry Combat Loads — Fixed bridges of aluminum or steel will carry the infantry's combat and other vehicles. The aluminum version will replace, generally, the Bailey bridge of World War II. It has fewer and more easily connected parts and can be erected in a shorter time than a Bailey bridge of comparable capacity.

A larger version of the division bridge is the army-type structure, built to handle combat and supply loads of a field army over a wide range of spans. This bridge, which may be made of either aluminum or steel, can be constructed with a single or double roadway.

Pneumatic pontoons adaptable to a variety of bank conditions are integral to the new floating bridges.

Barium Seeking Private Funds

Barium Steel Corp. is seeking private funds to carry on expansion of its steel facilities at Harrisburg and Phoenixville, Pa. The company has certificates of necessity for accelerated amortization of these facilities, totaling $50,950,000. That for Central Iron & Steel Co., Harrisburg, amounts to $21,950,000; for expansion at Phoenix Iron & Steel Co. the certificate amounts to $29,000,000.

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PROGRESS REPORTS FAVOR EXTENDED USE OF NATIONAL CARBON IN BLAST FURNACES

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Test it and . . . you always buy it!

● The future of "National" carbon as a preferred material for blast furnace linings is definitely assured by the mounting evidence of its extra long life in hearths and, more recently, in side walls all the way up to the mantle.

Already, indications are that, as carbon goes *up* the furnace, operating costs come *down*. Fewer shut-downs, more uniform casts are consistently being obtained in existing installations. And increased capacity can be expected to result from the use of thinner wall sections, made possible by this ideal furnace-lining material.

Furnace operators are urged to keep their eyes on carbon and on the growing body of data covering its use in modern, high-tonnage-life furnaces.

OTHER NATIONAL CARBON PRODUCTS

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Shipbuilding Gets Shot in Arm

Bethlehem receives orders for five Mariner freighters . . . Yards had been in doldrums, living on repair work . . . Local pressure on Maritime Commission was heavy—*By T. M. Rohan.*

West Coast shipbuilding, which has languished on routine repairs since the heyday of World War II, got a shot in the arm last week as work started in the San Francisco yards of Bethlehem Pacific Coast Steel Corp. on five $9½ million, 12,900-ton Mariner freighters.

Awarding of contracts to Bethlehem at about 10 pct higher price than for 30 similar vessels being built in the East is admittedly a shot in the arm to sustain western shipbuilding. Contracts were let to Bethlehem by U. S. Maritime Commission after considerable prodding by newspapers, civic officials and legislators. This is the only new shipbuilding on the Coast at present but Portland and Seattle yards have received repair and alteration work.

Help Wanted—Over 3000 new workers must be recruited in addition to the 2000 now engaged in repairs. Although 18,000 workers turned out 48 destroyers and auxiliaries at Bethlehem during World War II, most have since drifted to aircraft work.

The five ships, each measuring 560 ft, will consume 40,000 tons of steel. They are all welded, carry 12 passengers and 56 officers and crew. They will be the fastest cargo ships afloat with maximum horsepower of 22,000 on the single propeller, highest of any type. Construction will take an estimated 2½ years.

All propulsion machinery, many larger hull plates and a section of the propeller shafts will come from the East. Freight charges account for the traditional higher cost of western shipbuilding. Meanwhile civic officials in coast cities are making surveys to learn if additional heavy shipbuilding can be undertaken.

Plane Backlog—Orders for 12 new Super Constellations from six foreign airlines including Spain and Colombia raised Lockheed's current backlog last week to $260 million. New orders, worth $25 million, extend scheduled production to spring, 1954. The new plane uses the Wright 3350 compound engine and is the fastest duction has been set at well over 400 planes.

Less Nickel—Military production is now consuming 95 pct of the U. S. nickel supply. As a result nickel-bearing automotive parts will probably be short early in 1953, Robert Cass, deputy director of National Production Authority's Motor Vehicle Div., said in a San Francisco conference. Parts to be hit first will be gears, thermostats and valves. Current supply of replacement parts is excellent, Cass added.

Becalmed—Pending the U. S. Supreme Court decision on legality of President Truman's seizure, western steel activity was in the doldrums. The flood of propaganda has temporarily abated; production continues at over 100 pct; scrap buying is normal for the season. But forecasts, expansion plans, etc., are conspicuously absent.

Western steel markets have been somewhat softened by business uncertainty and the continuing rash of construction and tradesmen's strikes. Steel warehouses are filled; scrap piles are high although prices generally continue firm.

Keep It Going—Concern over methods of continually accelerating the productivity of American industry is growing among Western business leaders. Faced with a tight skilled labor market, shortage of tools, increasing tax burden and swelling population, the problem is growing.

The University of California announced last week its fourth annual management conference Sept. 10-13 at Yosemite National Park will be devoted to this basic question. University, business and union authorities on the subject will pool their knowledge in a searching inquiry of basic methods.

Gas Turbine Truck—A truck powered by a 175-hp Boeing gas turbine will be shown publicly for the first time at the Los Angeles National Truck and Trailer Show June 12-15. The truck has undergone exhaustive tests since its announcement in 1950. Production of the power units for the Navy was recently announced.

Still Growing—Over $62 million in NPA defense rated allotments for third quarter construction representing 11 pct of the nation's total projects and 18 pct of the cost went to California.

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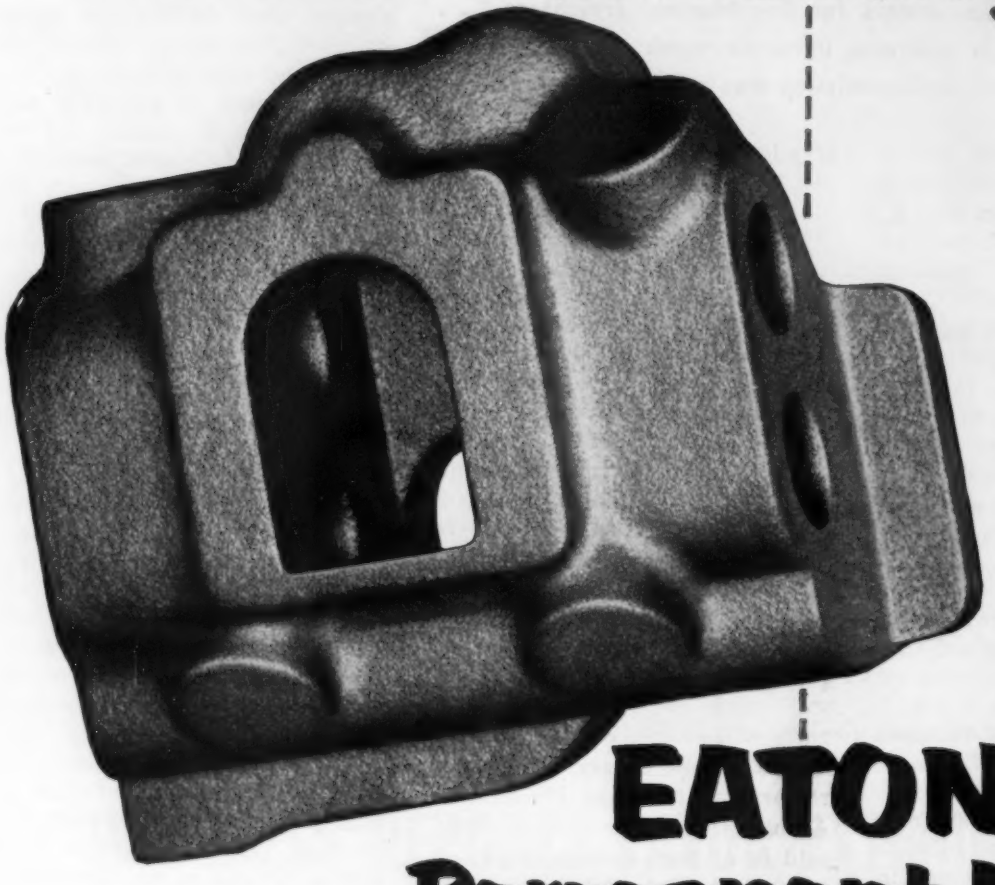

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New Nickel Company with New Process

Third producer enters nickel production lineup . . . Sherritt Gordon Mines will spend about $29 million on plant . . . Has new nickel process for Lynn Lake ores—*By F. Sanderson.*

International Nickel Co. of Canada and Falconbridge Nickel Mines are currently Canada's sole producers of nickel. There will be a change in this picture as another company enters production. Sherritt Gordon Mines is now being plumed for output.

Its plans for nickel include construction of a $17 million refinery on which preliminary work is just getting underway. Completion is scheduled for October, 1953. Location of the project is at Fort Saskatchewan in Alberta.

It will cost Sherritt Gordon a total of about $29 million to become Canada's third nickel producer. Superficial examination of the investment may result in the snap judgement that the company is doing a bit of gambling.

New Nickel Process—But Sherritt Gordon is introducing something new to nickel refining—a process that has been worked out by Professor Frank Forward of the metallurgical department of British Columbia. It will be a leaching method said to be especially adaptable to the treatment of Lynn Lake Ores. Some patents held in the United States by the Chemical Construction Corp., a subsidiary of American Cyanimid Co., will be used.

It's believed Sherritt Gordon's new process will eliminate need for a lot of costly equipment conventionally used to treat and refine nickel and other metals. Capital outlay should be much less than if the usual smelting and refining techniques were used.

Good Gamble — Full details of the new nickel recovery process have not been revealed. But a number of patents (some held by Sherritt Gordon, others by Chemical Construction which are included in the nickel method are also being used in the refinery and ammonia plants at Fort Saskatchewan. These use gas for a fuel and utilize the ammonia leach process which wipes out need for the usual smelting and electrolytic refining plants.

Cocky on Nickel — Canada can well be cocky about its nickel resources. It has something approaching a monopoly in this steel alloying element. Nickel was first produced here in 1886 from deposits in the Sudbury area. These deposits continue to be the most extensive yet discovered in the charted world.

Both International Nickel of Canada and Falconbridge derive their raw materials from this area. There is enough ore in Sudbury alone to provide an uninterrupted flow of nickel to world markets for many generations to come.

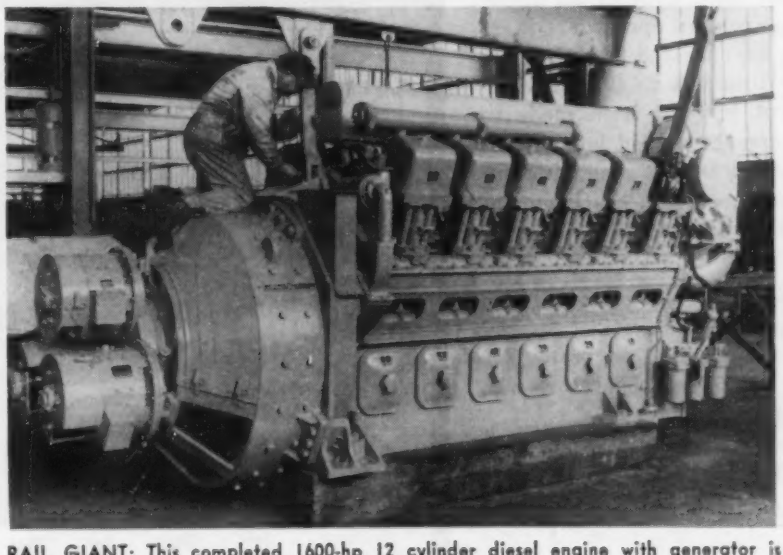
And Canada has an ace up its sleeve. Sudbury is not the only area containing valuable nickel.

No Luck—For at least 25 years, British Columbia has been trying to get a major steel plant to include blast furnaces. So far there's been no success.

B. C. interests want to use the iron ore in their province. They point out there is ample opportunity for a successful steel project. Eastern interests are skeptical and aren't participating.

Ore to Japan—Argonaut Co., a subsidiary of Utah Construction Co., is mining B. C. ore. The bulk is going to Japan to be returned to this country as finished products. Argonaut's plans call for shipping about 140,000 tons monthly. All ore presently being produced is going to Japan, except minor deliveries to the Vancouver Rolling Mills.

The chief source of iron ore at this time is Quinsam Lake on Vancouver Island. But Argonaut now is drilling the Iron River property of Canadian Colleries.



RAIL GIANT: This completed 1600-hp 12 cylinder diesel engine with generator is given finishing touches before it's shipped to Montreal Locomotive Works from the producer, Dominion Engineering Works, Ltd.

Are Tape-Controlled Tools Practical?

Some machine tool men snicker at demonstration of punched tape controls . . . Most don't think idea's practical yet . . . Others say it will develop swiftly . . . List needs—*By G. Elwers.*

Recently, a group of machine tool electrical men listened with amused tolerance to a description of a machine tool controlled by a punched-tape mechanism. When a slide of the setup showed the size of the necessary control equipment, snickers broke out. Later corridor talk indicated general disbelief that such equipment would be practical for many, many years—if ever.

Yet some students of machine tool control believe that numerical control development will proceed rapidly and will become practical sooner than machine tool traditionalists expect.

Why Needed — There are two ways of looking at the need for such control devices. One is the reduction of skilled labor required to set up a machine tool for a given job.

Machine tools today are highly developed from the standpoint of reduction of operating labor. Many need little or no attention from an operator. Others can be operated by relatively unskilled labor. But little attempt has yet been made to reduce the skilled labor needed to transmit operating instructions from the blueprint to the machine.

Setups Expensive—Skilled setup men are still required to get a machine ready for the unskilled operator who keeps it going.

Every time the machine is changed over from one operation to another, the setup procedure, expensive in time and quality of labor expended, must be repeated.

It is this function which numerical control can mechanize.

Coded on Tape—Numerical control means reducing blueprint information to coded numbers on punched tape, magnetic tape, film, or other such medium.

This information on tool path, feeds, and speeds, is supplied automatically to the machine tool by reading the tape in a suitable device which operates the machine's controls according to the instructions.

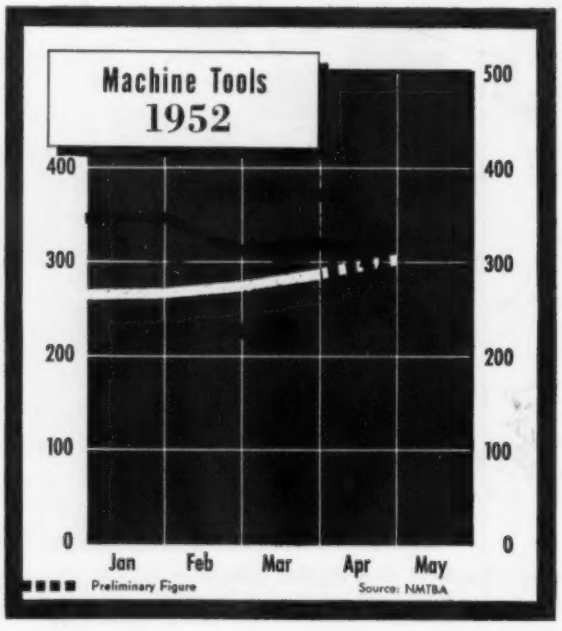
Changing from one operation to another can become simply a matter of changing tapes, and in some cases, changing tools. The point is that reading of blueprints and translating the information into setup of the machine, is not required of shop personnel when numerical control is used.

Fill the Gap—The second angle is that such control can be used to fill the gap between single-unit production and mass production.

A single piece is made on a standard machine tool by whatever method is convenient, with little thought of the production cost. To justify the cost of setting up a turret lathe, or making a template for a contour lathe, or tooling up an automatic screw machine, usually requires that the part be made in large quantities.

No Man's Land — Between the single part and the run in quantities of, say, 50 or more, lies an area where nothing now is economical. It is wasteful to make 16 pieces by the method used to produce just one. It is usually also too expensive to set up even a turret lathe for only 16 pieces.

But it would be practical, and economical, to punch a tape and insert it in the control device, to make six, or 16, or 60 pieces.



Standardization — An international technical committee on machine tool standardization will meet in New York in June, as part of the General Assembly of the International Organization for Standardization.

The United States is not a member of the IOS machine tool group, but will have observers at the meeting. Members of the American Standards Assn.'s committee on small tools and machine tool elements also will attend.

Discuss Definitions — The agenda calls for discussions on definitions and measurements, tapers, milling machine spindle noses, speeds and feeds, lathe centers, T slots, direction of drive operation, tool holders, assembling of machine grinding wheels, lathe spindle noses.

For five of these 12 items, American standards already have been adopted.

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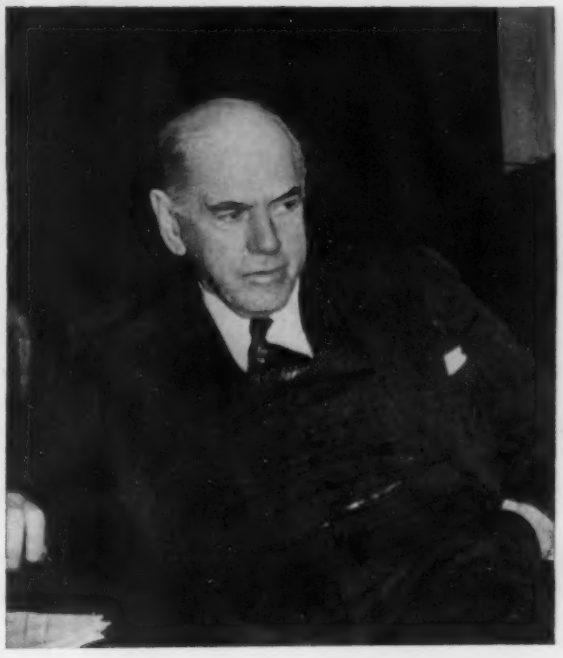
The Iron Age

SALUTES

Eugene G. Grace

A strong believer in free enterprise, he does his best to make it work . . . His name has come to stand for sound management.



YOU are never in doubt about where you stand with Eugene Grace—or where he stands on any issue. He will tell you bluntly. And once he sets a course he follows it to the end.

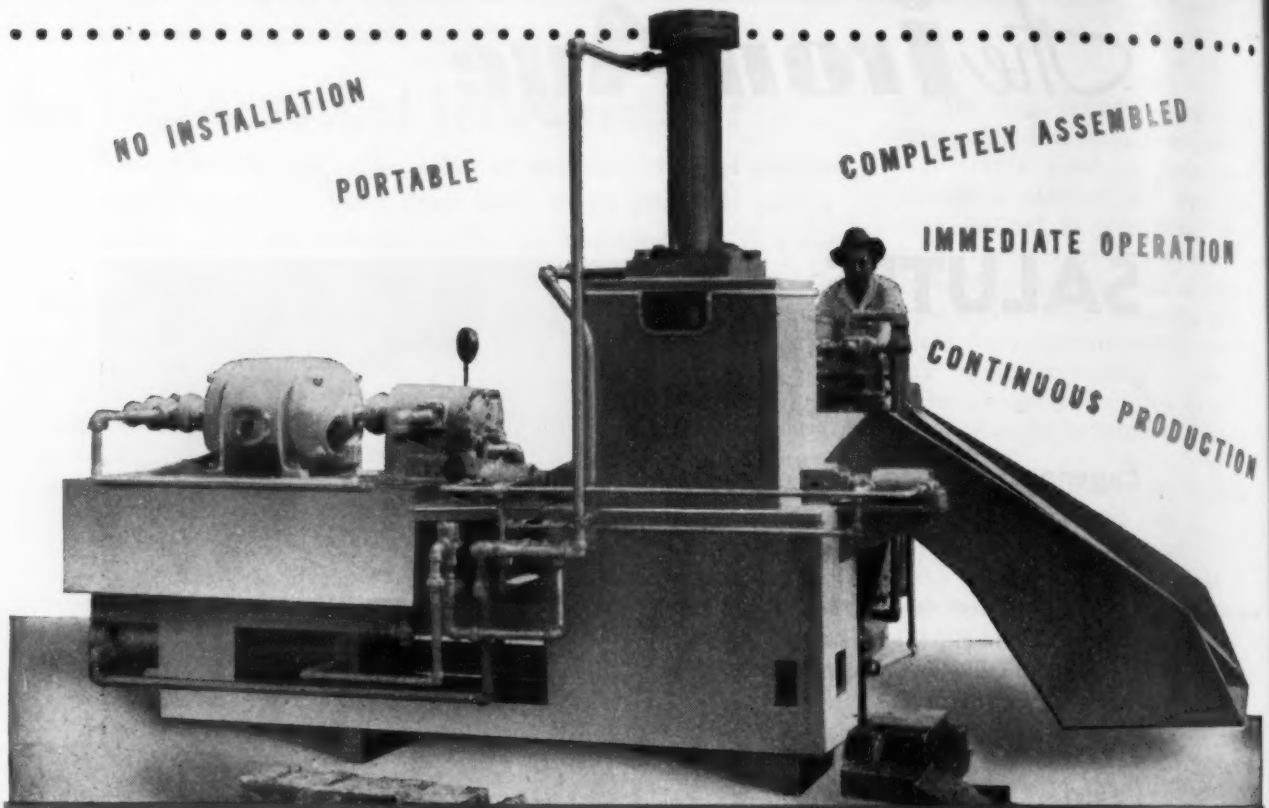
He passionately believes every person should know the difference in his heart between right and wrong and steer his course accordingly.

He learned the facts of business life early, and he hasn't forgotten them. After leading his class at Lehigh University (1899), he started at the bottom with "little" Bethlehem Steel. When Charles Schwab bought Bethlehem and combined it with other properties in 1905, it didn't take him long to peg Gene Grace as a man of promise. After that, promotion was rapid: General manager in 1908, president in 1913. (He became chairman of the board in 1945.)

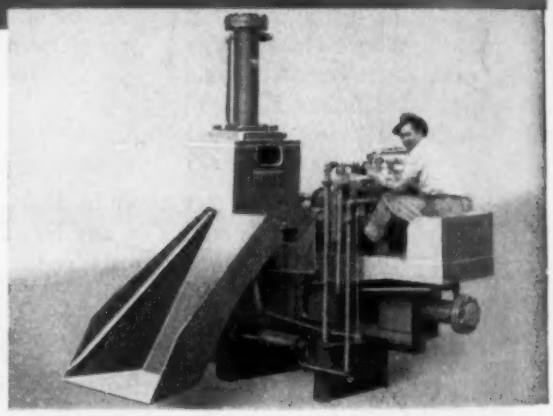
Perspective and patriotism are part of his character. Much as he abhors controls, he played a leading role in working out the Controlled Materials Plan that worked so well during World War II. (He doesn't believe CMP is necessary now.)

You don't have to know Gene Grace long before you begin to connect him with sound management. Not sound in the sense that he won't take a chance, but in the sense that he's usually right. Bethlehem stockholders have profited by having a man who never forgets he is managing their property.

Harris Non-Ferrous Metals Baling Presses



Bundle Size Attracts Dealers and Smelters



The HARRIS Non-Ferrous Metals Baling Presses were designed primarily for use in baling non-ferrous scrap. A particular feature of this design is that continuous baling is obtained, since the charging box is open while the bale is being made and ejected. The charging box is large enough to handle bulky material such as wire, sheets, etc. Pressures used make an exceptionally dense bale—approximately 40% density.

Dealers find these presses excellent also for baling sheet iron clippings and tin cans. The size and density of bundles are especially attractive for charging in electric furnaces.

The three models of this design provide an ample range to meet all requirements.

Size of Charging Box	33" x 33" x 24"	Vickers Vane Type Rotary Pump	2,000 lbs. per sq. in.
Average number of bales per hour	60 - 70	Space Required	10' x 12'
Size of Electric Motor	50-Hp. 1200 Rpm	Shipping Weight	20,000 lbs. (approx.)

AVERAGE SIZE OF FINISHED BALE

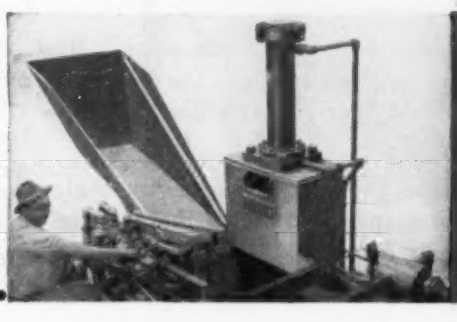
NF-40	5" x 5" x 15"
NF-50	5" x 7" x 15"
NF-80	8" x 8" x 15"

AVERAGE WEIGHT OF BALE

NF-40	40-60 lbs.
NF-50	50-70 lbs.
NF-80	80-100 lbs.

AVERAGE TONNAGE PER HOUR

NF-40	One and one-half tons
NF-50	Two tons
NF-80	Two and one-half tons



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The Iron Age

INTRODUCES

Ralph C. **Archer**, becomes vice-president in charge of manufacturing, INTERNATIONAL HARVESTER CO., Chicago; **Eugene F. Schneider**, named general manager, Farm Implement Div.; **Mark V. Keeler**, becomes general manager, Farm Tractor Div.; and **Charles D. Harris**, promoted to general manager, Refrigeration Div.

R. W. **Owens**, elected senior vice-president, ELLIOTT CO., Jeannette, Pa.

Paul E. **Shroads**, appointed a vice-president, NATIONAL STEEL CORP., Pittsburgh.

Herm **Boley**, appointed assistant to the president, DENISON ENGINEERING CO., Columbus, Ohio.

Wallace H. **Hitchcock**, elected vice-president, in charge of Pacific Coast Div., REVERE COPPER & BRASS INC., New York.

Robert J. **Heggie**, elected vice-president, A. M. CASTLE & CO., Chicago.

H. A. **Gardner**, elected chairman of the board, LYON METAL PRODUCTS, INC., Aurora, Ill.; **H. B. Spackman**, elected chief executive officer; H. F. **Sadler**, elected to board of directors. Mr. Gardner succeeds Earl D. Power, recently deceased.

Foster H. **Pettay**, elected a vice-president, OHIO CRANKSHAFT CO., Cleveland; **Chester H. Kimmel**, also elected a vice-president.

Ernest J. **Klimczak**, appointed chief engineer, secretary of the company, and member of the board of directors, AHLBERG BEARING CO., Chicago.

Frank P. **Taugher**, appointed to the newly-created position of assistant to the vice-president, WESTINGHOUSE ELECTRIC CORP., Pittsburgh; **D. L. Pierce**, named manager of the industrial control engineering department.

E. L. Oliver, Jr., appointed executive vice-president, OLIVER UNITED FILTERS INC., New York.

Frank B. Brophy, promoted to general superintendent, TENNESSEE COAL & IRON DIV., U. S. Steel Corp.; **J. O. House**, promoted to maintenance superintendent: **Joseph A. Miller**, promoted to mine superintendent; and **Samuel K. Mynatt**, named mining engineer. **W. A. Quisenberry**, appointed to the newly-created post of safety and ventilation inspector.

Harry C. Brainard, appointed chief metallurgist, CLEVELAND CHAIN & MFG. CO., Cleveland.

Richard V. D. Strong, appointed chief engineer, F. J. STOKES MACHINE CO., Philadelphia.

George B. Hamilton, appointed general manager, Amino Products Div., INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago.

Charles Watts, named assistant chief engineer, CLAYMONT STEEL CO., Claymont, Del., subsidiary of Colorado Fuel & Iron Co.

Edwin M. Ott, named manager, newly organized Investment Analysis Div., PENNSYLVANIA SALT MFG. CO., Philadelphia.

A. E. Dorn, named industrial sales manager, Tractor Div., ALLIS-CHALMERS MFG. CO., Milwaukee; **Howard M. Snapp**, named assistant engineer, steam turbine section; **Alfred L. Morningstar**, becomes assistant application engineer, control section.

Charles Castle, named sales manager, distributor division, WEBSTER-CHICAGO CORP., Chicago.

W. C. Whitehead, named acting general manager, THE GARRETT CORP., Los Angeles.

JAMES J. NANCE, elected president and general manager, Packard Motor Car Co., Detroit.

JOHN C. SHARP, elected president, general manager, and a director, Hotpoint, Inc., Chicago.

ROBERT S. BURNS, appointed president, Western Electrochemical Co., Culver City, Calif.

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Personnel

Continued

James Beckley, appointed resident controller, Ohio plant, FRUEHAUF TRAILER CO., Detroit.

Roy Carter, appointed manager, Volute Pump Section, WORTHINGTON CORP., Harrison, N. J.; **L. H. Garnar,** appointed manager, Process Pump Section; and **I. J. Karassik,** named manager, Multi-Stage Pump Section.

Edwin E. Davis, appointed manager, Order Div., JONES & LAUGHLIN STEEL CORP., Pittsburgh.

C. Duff Brown, appointed works manager, DUFF-NORTON MFG. CO., Pittsburgh.

Henry W. Kruschwitz, Jr., transferred to sales department as sales engineer, METAL HYDRIDES INC., Beverly, Mass.; **Robert D. Gray,** appointed superintendent, Chemical Hydrides Div.

Dave Heckinger, joins sales engineering staff, FANSTEEL METALLURGICAL CORP., Chicago.

John A. McGown, named manager of quality, standards & manufacturing engineering, X Ray Dept., GENERAL ELECTRIC CO., Milwaukee.

Lester J. Andregg, appointed manager of operations, DUMAS STEEL CORP., Pittsburgh.

Thomas R. Nugent, promoted to newly-created position of sales consultant, INLAND STEEL CONTAINER CO., a subsidiary of Inland Steel Co., Chicago; **Gordon L. Sheehan,** also promoted to central regional sales manager.

Robert H. Bobilin, appointed chief engineer, DAVIES SUPPLY & MFG. CO., St. Louis.

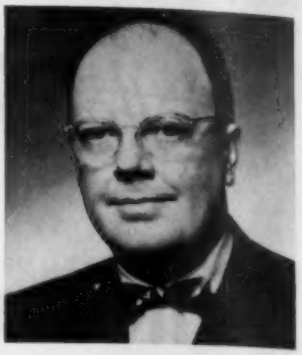
Harold A. Krueger, appointed manager, St. Louis Smelting and Refining Div., NATIONAL LEAD CO.

William L. Hartley, named belt conveyor specialist, LINK-BELT CO., Chicago.

J. R. McAlpin, appointed district manager, Houston office, SHEFFIELD STEEL CORP.

W. E. Vogel, appointed sales manager, BEAVER TOOL & ENGINEERING CORP., Royal Oak, Mich.

Harold R. Boyer, named plant manager, Cadillac Motor Car Div., tank plant, Cleveland, GENERAL MOTORS CORP.



J. P. MANSFIELD, elected president, Plymouth Motor Corp., a subsidiary of Chrysler Corp., Detroit.

THOMAS D. CARTLEDGE, appointed president, Linde Air Products Co., a division of Union Carbide & Carbon Corp., New York.

HOWARD S. BUNN, appointed president, Bakelite Co., a division of Union Carbide & Carbon Corp., New York.

J. M. OLESEN, elected a vice-president, Lyon Metal Products, Inc., Aurora, Ill.

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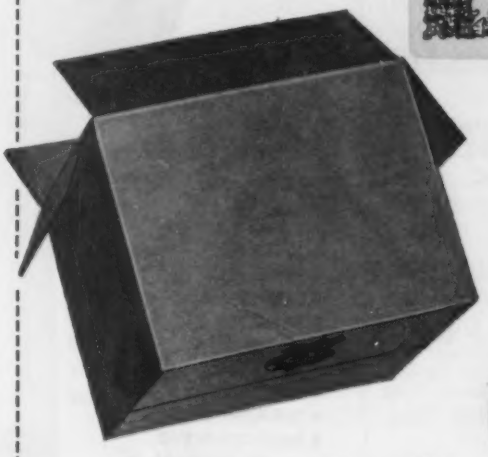

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—Personnel—
Continued

Howland Hayes, appointed field representative, northern New Jersey District, MILFORD RIVET & MACHINE CO., Milford, Conn.; **Robert D. Richter,** appointed field representative, Metropolitan New York. **W. T. Peterson,** named field representative, Michigan District.

Robert Oehler, appointed Chicago district sales engineering manager, ANKER-HOLTH, Div. of The Wellman Eng. Co., Cleveland.

Will Cain, appointed New Orleans sales representative, A. O. SMITH CORP., Milwaukee.

Edward C. Sterling, Jr., appointed Western Div. sales manager, Cherry Rivet Div., TOWNSEND CO., New Brighton, Pa. His offices will be in Los Angeles.

Harold Niemeyer, appointed assistant to the area manager, WESTERN GEAR WORKS, Lynwood, Calif.; **Stan Coultas,** promoted to production manager.

V. A. Hedlund, appointed special service engineer, in the electronics field, SHAKEPROOF INC., a division of Illinois Tool Works, Chicago.

Robert T. Jones, appointed field engineer, CHIKSAN CO., Brea, Calif. plant.

James C. Grindey, joins sales office staff, Chicago, METALS DISINTEGRATING CO., INC., Elizabeth, N. J.

John H. Gorman, appointed field electrochemist, Michigan-Ohio territory, HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Albert Dormaier, Jr., appointed direct sales engineer, PRECISION METALSMITHS, INC., Cleveland.

Robert M. Bonk, named district representative, Southeastern District, Construction Materials Div., GENERAL ELECTRIC CO., Bridgeport, Conn.

OBITUARIES

Walter G. Blume, 52, assistant general manager of sales, Superior Steel orp, Carnegie, Pa.

Wallace Eshelman, 63, general superintendent of Bethlehem's Pacific South San Francisco plant.

Marcus A. Grossman, 61, advisor —research and technology, U. S. Steel Co., Pittsburgh.

George W. Waterhouse, 68, professor of metallurgy at Massachusetts Institute of Technology, and a consulting engineer.

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188	338	700	1250	1800
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A testimonial—

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Technical Articles

Small Plants favor INDUCTION FURNACES

By Lewis B. Reed
Industrial Power Consultant
Dept. of Water and Power
Los Angeles

Small plants in the Los Angeles area have found electric induction furnaces more suited to their needs than gas furnaces—despite higher melting costs of induction furnaces. Lower maintenance costs, silicon dispersion without labor, and better temperature control are cited. Also in favor are the lack of noxious and sulfurous fumes, lowered operator fatigue, and lack of heat, open flames and fire hazards. Induction furnaces permit high metal recovery.

Melting cost is secondary in considering the use of induction melting many users of induction furnaces have declared in interviews recently made in the Los Angeles area. Any comparison of 60-cycle induction and gas-fired furnaces for melting aluminum on a basis of melting cost alone does not give full emphasis to other production and cost benefits possible with induction furnaces, these plant operators feel.*

There are no large mass-production industries in the Los Angeles area. Practically all manufacturers are small concerns with restricted capital, typical of thousands of small businesses in this country.

Approximately 22 60-cycle induction furnaces with a connected load of 1640 kw are located in the Los Angeles area. Every furnace has been installed in the last 5 years. In almost every case the induction furnace replaced a gas-fired furnace. In only two cases have induction furnaces been displaced with gas-fired furnaces.

A typical modern plant is McCulloch Motors Corp. Both gas-fired and induction furnaces had been used in the old die casting department. In preparation for a plant expansion—now completed—an evaluation of both types was made. A strong preference for electric melting was the result. Ten induction furnaces are now used for holding molten aluminum. Additional electric furnaces are on order for breakdown of the metal. Fourteen specially designed electric resistance furnaces have been installed to melt and hold the magnesium used for die castings.** Gerald Robechaud, vice-president, tooling, has listed the following reasons for replacing the gas-fired furnaces with induction furnaces:

(1) No silicon dispersion, (main source of trouble with gas-fired furnaces).

(2) Better temperature control.

(3) Employees prefer the electric furnaces

* For a previous article on this subject see "Induction and Gas Furnace Melting Costs Compared," The Iron Age, Dec. 27, 1951, p. 62.

** At present, induction melting of magnesium is not feasible until a suitable refractory is developed.

Melting headaches gone—

THREE TESTS OF INDUCTION FURNACE MELTING RATES

Test	Capacity of Furnace		Lb Melted/Hr	Pct Capacity of Furnace	Kw Hr/Lb	Cost/100 Lb @ 8 Mills*	Electric Rate Earned by Customer	Customer Cost/100 Lb	Hold Cost/Hr
	Kw	Lb/Hr							
A	40	200	44.79	22.4	0.4431	$0.355	$0.00684	$0.303	$0.0776
B	40	200	57.62	28.8	0.4397	$0.352	$0.00684	$0.301	$0.0776
C	50	250	176.47	70.6	0.2260	$0.181	$0.006	$0.136	**

* Highest rate which Los Angeles Department of Water and Power customers with induction furnaces would be apt to use. No demand charge in rate schedule.
** Furnace working 720 hr a month. No hold time.

because there is no heat, no open flames, and no danger.

(4) No noxious or sulfurious fumes attack machinery and the building.

(5) Operator fatigue is noticeably reduced.

Anderson Diecast and Engineering Co. has two induction furnaces. Jim Bennett, plant engineer, has stated "operating costs of the induction furnace are on a par with our gas-fired furnaces, if maintenance costs are included. In fact the induction furnace has a slight edge. You get better alloy mix from induction melting, with no segregation. With gas-fired furnaces it is necessary to flux or drop in degassing pills to stir the bath. All in all, there is less labor involved, and inclusions which would show up later in machining are practically eliminated."

Wilbur Chapman of Pasadena runs a typical small die casting business. In Pasadena, natural gas costs 40¢ a therm. Electric energy for melting costs him 1¢ a kw-hr. The estimated energy cost for melting 100 lb of aluminum with gas is 10.8¢ compared to 28¢ with induction.

Offsetting this higher cost for induction melting, Mr. Chapman has found "down" time was considerably less. The refractory lasts well over a year. Cost of holding molten metal over Sunday is less than the added cost of having a man come in at 5 a.m. each Monday and fire up the gas furnace. Fire hazard is considerably less.

Die Cast Products, another small shop, installed its one induction furnace in July, 1950. The furnace has not been "down" to date. Rudy Beck, co-owner, has this to offer: "Our melting headache is gone. The induction furnace took it clear out of the shop." The furnace permits cleanliness and comfort in the shop.

Price Pfister Brass Mfg. Co., manufacturers of brass plumbing goods, uses two induction furnaces for their die casting department. Both furnaces are being used for defense work. The casting alloy contains 13 pct silicon, and molten metal must be kept thoroughly agitated to maintain proper consistency. With any furnace but an induction furnace, agitation would have to be done manually, with the degree of segregation remaining in doubt. Price Pfister has been producing this item 24 hrs a day for over 5 months without a stop. No silicon has settled out during this period.

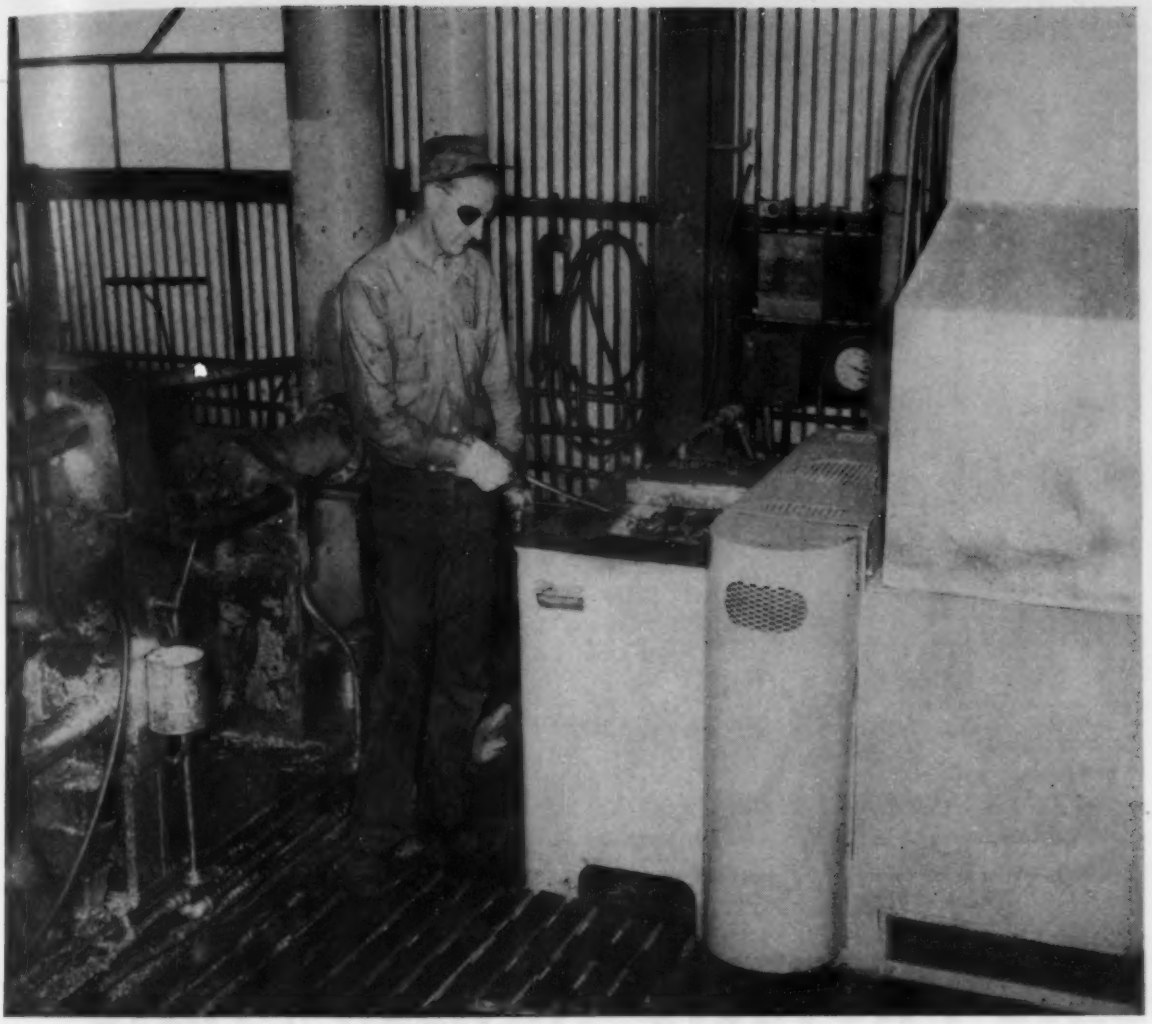
While it is possible to run an alloy containing 13 pct silicon with a gas-fired furnace, it takes considerable labor to eliminate segregation. The induction furnace does an excellent job in eliminating segregation with no labor.

Hunter Douglas Corp. at Riverside uses three 333 kw induction furnaces in their continuous casting process, where temperature and alloy control are important factors. Associated with Hunter Douglas Corp. as director of Research and Development, is one of the foremost aluminum metallurgists in this country, Ray Quadt.†

On induction furnaces Mr. Quadt has said:

† See "Aluminum Strip Rolled From Continuously Cast Bar," by J. L. Hunter and R. A. Quadt, The Iron Age, April 10, 1952, p. 118.

CLOSE UP VIEW of one of the three 333 kw aluminum melting induction furnaces at Hunter Douglas Corp., Riverside, Calif. Ajax furnace assures continuity of metal flow.



INDUCTION FURNACE at Die Cast Products has not been "down" since July, 1950. Lindberg 40 kw 60 cycle furnace has simplified melting problem. Partner Rudy Beck reports induction furnace has helped keep shop cleaner, more comfortable.

"One of the greatest advantages in using low frequency electric induction furnaces stems from the fact that the furnace is essentially a cold top melting furnace. Since no part of the metal exposed to air ever exceeds the average metal temperature, it is essentially impossible to increase the normal rate of oxidation, and therefore recovery is higher than would otherwise be expected.

"For instance, it is not unusual to obtain an average recovery on commercial pig of 99.5 pct. Even much of the metal that is skimmed with the dross from the furnace can be recovered in subsequent operations and can be returned to the melting cycle. The savings become even more striking when lower grade scrap is used.

"Thin sheet, foil, borings, turnings, etc., will show recoveries higher than would be expected from crucible or reverbertory-type furnaces because it is of considerably less importance that the scrap be submerged in the aluminum before it becomes overheated and oxidizes. The large increase in recovery under these circumstances more than justifies the increased initial cost of the furnaces when large tonnages of metal are being melted.

"A second major advantage in the induction furnace is metallurgical. When an aluminum alloy is being produced from different scrap compositions or from pure metals, including alloying ingredients, it is not necessary to stir the metal bath to insure uniformity.

"The furnace itself does a superior job of thoroughly mixing all alloying ingredients, and a completely uniform melt is invariably obtained. All this is done without the use of manpower and eliminates the tedious and arduous task of stirring that otherwise must be done in a crucible or reverberatory-type alloying furnace."

Cost of melting is small when compared with overhead costs, and the overhead is less with the induction furnace installation. This decrease, combined with accepted amortization practices, has eliminated practically any consideration of the higher melting cost with electric energy.

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Your trucks can benefit—

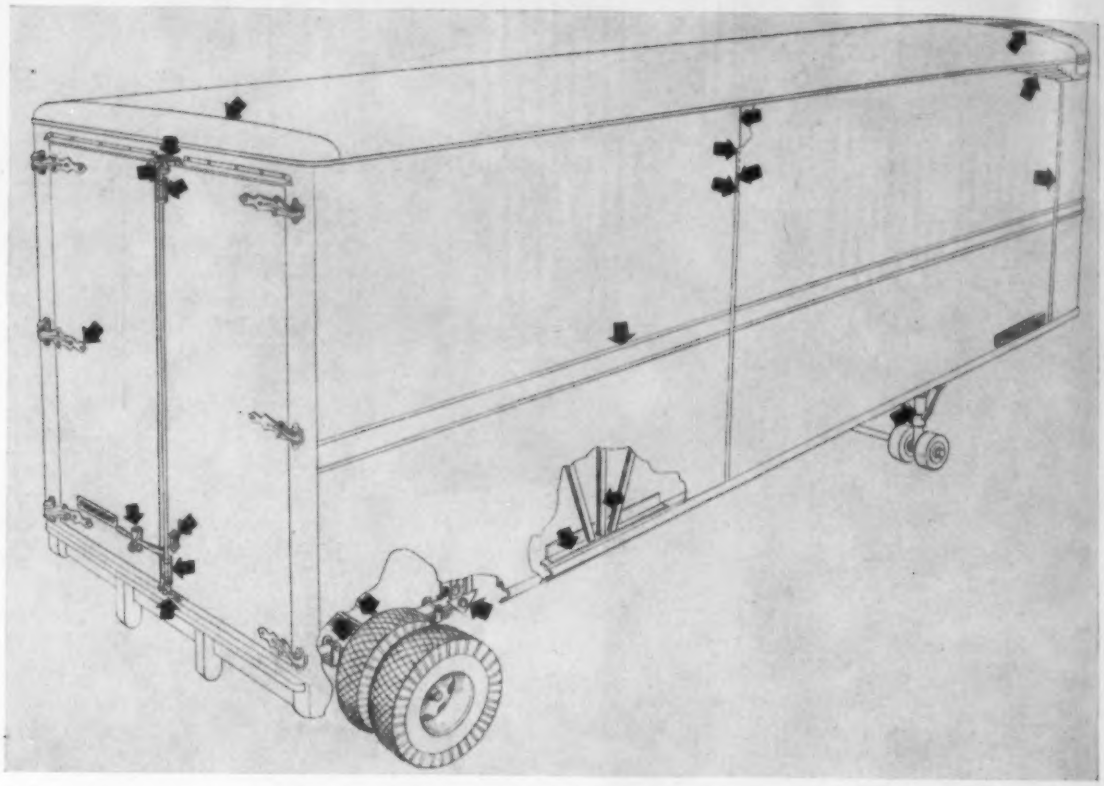


FIG. 1—Major parts protected by zinc base coating are pointed out in drawing of big Fruehauf highway trailer.

ZINC PROTECTS TRAILER PARTS from corrosion

By W. G. Patton
Asst. Technical Editor

A zinc protective coating, Zincilate 300, has been used extensively by Fruehauf Trailer Co., to protect steel parts from corrosion. Fruehauf, largest manufacturer of highway trailers in the country, has found the protective coating more expensive than prime paint but less costly than hard-to-get cadmium. The new protective coating gives good coverage and may be quickly applied by brush, spray or dip.

A hard, zinc-containing coating applied like paint protects 75 of the exposed metal parts of thousands of Fruehauf trailers carrying several million tons of freight daily over the nation's highways from coast-to-coast in all kinds of weather and under the broadest possible range of driving conditions.

During the past 3 years, Zincilate 300 has replaced cadmium on many of the exposed parts of Fruehauf trailers. Except for a few unexposed screw machine parts like worm gears in which a closely controlled, thin coating is desired, the new protective coating developed by Industrial Metal Protectives, Inc., Dayton, has replaced cadmium almost 100 pct on Fruehauf trailers.

Although costing more than prime paint, Zincilate coating is less expensive than cad-

mium protection. Other advantages of this protective method may be summarized as follows:

(1) Provides a hard coating that is impervious to road salt, mud and other corrosive agents encountered on public highways.

(2) A single coating gives adequate protection and provides an attractive gray, matt finish.

(3) Since it adheres well, the coating is relatively chip proof and is, to some extent, self-healing if chipping occurs.

(4) Eliminates the necessity of sending parts out of the plant for plating.

(5) Can be applied by the manufacturer or a trailer service station using standard spray, brush or dipping equipment.

(6) Metal surface preparation is relatively simple.

(7) Paint can be applied over Zincilate.

(8) Provides excellent resistance to abrasion.

(9) Coverage ranges from 500 to 600 sq ft per gal.

(10) Zincilate protection permits the use of carbon steel where corrosion-resisting grades were previously used.

(11) Protects parts during manufacture and storage as service parts.

Use of Zincilate has made it possible for Fruehauf greatly to extend the protection of its trailers against corrosion. For example, at its Cedar Rapids, Iowa, plant, about 10 pct of the castings previously used were cadmium plated. At present, 100 pct of all castings used are coated—without increasing production costs. At the company's Avon Lake plant, plain carbon sheets to which the coating has been applied have replaced galvanized sheets. Touch up expense has also been reduced.

Fig. 1 is a schematic diagram showing the major areas of Fruehauf trailers protected by Zincilate.

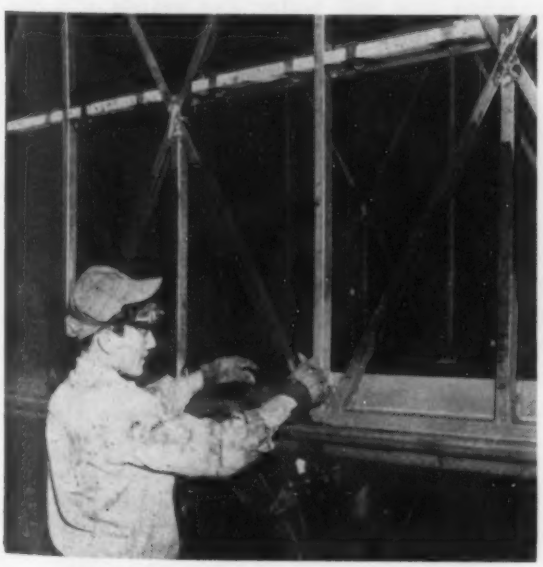


FIG. 2—Lower portions of welded steel tube framework are protected from corrosive effects of dampness at vital points.

FIG. 3—Parts are cleaned with chemically treated live steam in 2-stage automatic washer, left. At next booth Zincilate is sprayed against waterfall curtain.

Although Fruehauf produces more trailers than any other U. S. manufacturer, its production setup has, of necessity, many of the characteristics of a job shop. The company builds trailers to fit the needs of every U. S. industry in capacities ranging from 3 to 100 tons. Included in the list of models built are semi- and full trailers, as well as low bed carryall, platform trailers and tank trailers. Some of the trailers built by Fruehauf are 40 ft long.

Body size panels may be carbon steel, aluminum or stainless. The company also produces stake type trailers and many kinds of truck bodies.

As a matter of fact, Fruehauf trailers are, in reality, almost 100 pct tailor-made. Each trailer is designed to fit the specific needs of the customer and widely varying state highway laws. Experience has shown that the company must be prepared to meet a wide variety of demands within the same industry.

Gives service depots flexibility

Fruehauf engineering headquarters are located in Detroit but trailers are assembled at 8 strategic locations throughout the country. In addition, the company operates 80 factory-owned repair and service stations for the convenience of its customers.

With the nation now depending on motor transport increasingly for freight movement, the responsibility for providing uninterrupted service and fast repair service for trailers is readily appreciated. The choice of Zincilate as

Clean surface is necessary—

a protective coating against corrosion is based both on its proven performance in service and the ability of assembly plants and service depots to apply zinc coatings at relatively low cost.

In designing trailers, Fruehauf engineers are required to take more than ordinary precautions against corrosion. Parts that are coated include the molding retainer, both sides of the front and rear roof caps, edges of the body panels under the molding retainer, inside of the lower body panels up to 12 in. from the bottom edge and the outside face of the body skeleton extending upward a distance of 12 in.

Protected parts include carbon steel or malleable iron body hardware including hinges, hinge brackets and door hold backs. Similarly, brake line assemblies, fuse panel covers, cam lock assemblies, lock rod shims and handle keepers. Spring brackets, spring suspensions, brake assembly, landing gear parts—practically all steel and ferrous metal castings are zinc-coated. Included in the list of treated parts are many hidden beneath the skin of the trailer. Fig. 2 shows Zincilate being applied to an Aerovan model, the most popular type of van trailer being produced today.

A coat of zinc chromate primer is applied to the inside surface of steel body panels after Zincilate is applied.

The only metal preparation necessary is to provide a clean, scale-free surface. A standard alkali cleaning agent is used. Zincilate 300 is purchased as a powder which is added to the carrier in the ratio of 15.8 lb of pigment per gal to 5.3 lb of vehicle. The mixture is stirred vigorously prior to application.

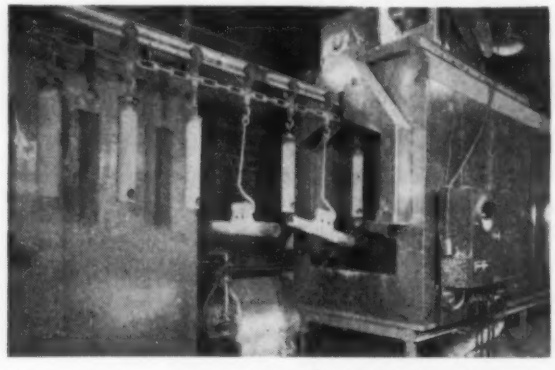


FIG. 4—Parts are conveyed through 300°F drying oven after being coated. Temperature is maintained automatically.

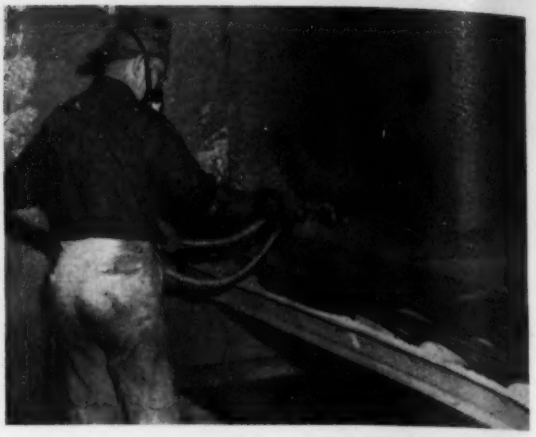


FIG. 5—Moldings, wings and other ferrous and nonferrous parts subject to rust or corrosion are sprayed with Zincilate.

Agitation is continuous to prevent the zinc from settling out. Thickness of a typical single coat is from 0.0015 to 0.003 in. When employed as a priming coat, the application is reduced to 0.0005 to 0.001 in. Coverage per gal is 500 to 600 sq ft.

The coating may be applied with spray guns, brushed on, or dipped on. Method of application depends on the size and shape of the part, coating thickness desired and production conditions. Baking is not necessary. Overcoating may be applied 5 to 10 min after treatment after which both coats can be baked at temperatures up to 450°F, Figs. 3, 4. Fig. 5 shows spray application on snap-on molding retainers.

Treated parts show no film failure after 1000 hr of standard ASTM salt spray exposure at 90°F with 20 pct solution. The coating is unaffected by marine conditions, mild acids, alkalies, hot water up to 150°F and air temperatures up to 600°F.

Zincilate offers satisfactory resistance to gasoline and salt water and resists oils and greases. Resistance to abrasion is excellent.

Welding coated plate and structural parts destroys only the surface protection immediately adjacent to the weld. Affected areas can be touched up to restore full protection.

Laboratory and field tests are now being conducted in which a single coat of olive drab Zincilate replaces the three-coat protection now being specified for Air Force and Ordnance trailer equipment. Tests conducted so far are highly promising.

NEW BOOK

"Practical Radiography For Industry," by H. R. Clauser. Working information on modern radiographic techniques as related to nondestructive testing, are presented. With some 200 illustrations and text, procedures, exposure factors and other details of this new technique are explained. Separate chapters are devoted to radiography with radium and Cobalt 60, fluoroscopy and other recent technical advances. Reinhold Publishing Corp., 330 West 42nd St., New York 36, N. Y. 301 p. $7.50.

To Speed Jet Production—

NEW RIGHT ANGLE LATHES Developed

The fast, accurate machining of jet engine rings, vanes, discs, wheels and other components gets another boost with the announcement of two new lathes designed specifically for this purpose.

The new machines are of the right angle, or cross-bed type. They are equipped with right and left power angular slides and tracer units for control of contouring operations on outside and inside diameters, or faces, from thin metal templates.

Both designs of machine are already in production at the Monarch Machine Tool Co.

One lathe, Model F, is a constant surface cutting speed machine. It has been so designed that the tool may operate on both sides of center for the finish facing of jet engine discs, wheels and comparable parts.

The other lathe, Model O, is supplied with two slides, one for turning, the other for boring. One of the slides is always tracer controlled. Both slides may be controlled in this manner, which makes it possible to produce many workpieces complete with one chucking. In some cases, both slides may be operated simultaneously, thereby reducing production time still further. This lathe has been developed particularly for the finish turning and boring of jet engine rings, vanes, shrouds and work of similar shape.

The Air-Gage Tracer controlled tool slide is of the swiveling type, mounted on a swiveling power angular feed slide. The combination imposes little limitation on the direction of tool approach to the work. Power unit for the tracer is mounted on a track at the front of the bed.

The tracer method of duplication from a template gives a continuous, single tool cut with a smooth, stepless finish. Automatic sizing is inherent in this method. The combination of air gaging and hydraulic slide control makes for a high degree of accuracy.

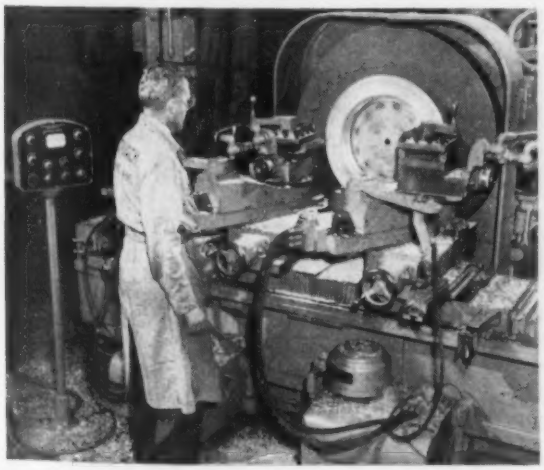
Headstock position on both machines is adjustable, by means of a large handwheel, over a total travel of 12 in. This brings the work closer to the operator, thereby making loading and unloading easier, and tool overhang can be kept at a minimum.

Designed chiefly for machining jet-engine wheels or discs, the Model F or constant surface cutting speed model of right-angle lathe has a 60-in. swing.

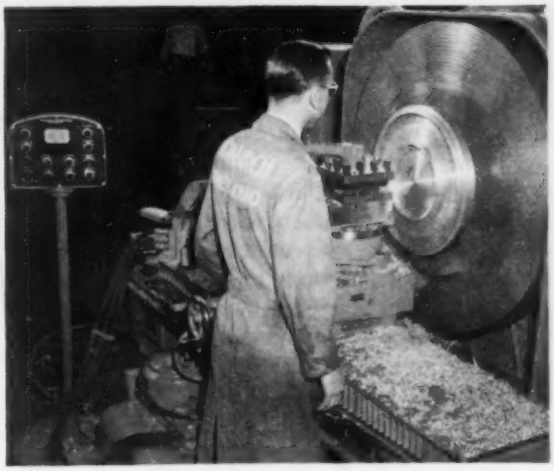
Spindle speed control is timed with the tool slide which travels at a right angle to the spindle. Speed variation is controlled by a speed control template. The regular speed control template gives automatic speed control over a diameter range from 32 down to 4 in. A template may be furnished to give automatic spindle speed control over larger or smaller diameter ranges. Pick-off gears provide the desired surface cutting speed range.

The reversing control of the work drive motor operates automatically as the tool passes from one side of the spindle center to the other. Automatic spindle speed control functions equally well on both sides of spindle center.

Complete push button control is a feature of both machines. The turning cycle is fully automatic. Both longitudinal and angular cross feed are infinitely variable. A pedestal type control panel provides headstock spindle control and control for the traverse and feed motion.



RIGHT ANGLE LATHE, constant spindle speed type, has two tracer controlled slides. Here they are operating simultaneously, one on a facing cut, the other boring.



CONSTANT SURFACE SPEED is used on this right angle lathe designed for facing operations on discs, such as are used in jet engines. The slide may be tracer controlled.

Care makes the difference—

HOW TO ANALYZE TIN-BRONZE ALLOYS

By C. Goldberg
Chief chemist
New England Smelting Works, Inc.
West Springfield, Mass.

Faulty sampling may often produce different analyses from the same lot of tin-bronze castings. Careful selection of sawings or drillings is the first step in obtaining accurate chemical analyses. Tin, lead, copper, iron, nickel, zinc and phosphorus content are usually sought. Silicon, aluminum or manganese are usually present as contaminants.

Accurate chemical analysis of tin bronzes presents a number of problems. Elements to be determined are, usually, tin, lead, copper, iron, nickel, zinc and phosphorus. Occasionally it is necessary to check for antimony and sulfur. Silicon, aluminum or manganese are present only as contaminants and are sought when such contamination is suspected.

Often differences between analyses from the same lot of castings or the same heat of ingots may be traced to faulty sampling. It is advisable to take sawings from as many places as possible and to saw through the entire sample. Small drillings serve almost as well. Filings, represent little more than the surface of the sample and are of small value.

Effects of surface oxidation and segregation must never be neglected. It is always good practice to pass a magnet through the sawings for tramp iron and to examine them carefully for sand particles or bits of slag.

Tin is usually determined first. Where accuracy within a few tenths of 1 pct is sufficient the tin may be determined as oxide by dissolving in nitric acid, filtering, washing, igniting and weighing. Where greater accuracy is desirable the oxide method is precluded because the precipitate invariably contains some or all of the antimony, phosphorus or arsenic. Again, it is difficult to prevent the residue on the filter paper from retaining some copper, iron and zinc, even with extensive washing.

It is sometimes stated in textbooks that lead is retained, also, but the author has never seen evidence of that. Ten 1 g samples of tin bronzes of various tin and lead content, for example, showed an average lead content of 0.005 pct. However, retention of the other elements may be serious. An average recovery from ten samples gave 0.015 pct Zn, 0.022 pct Cu, and 0.010 pct Fe.

Should the iron sought be of low concentration most of it may be held in the precipitate and the subsequent iron determination will be low. Practically all of the iron held by the residue may be recovered by treating with hot hydrochloric acid solution, filtering and determining the iron colorimetrically from the filtrate.

To check the tin content with greater accuracy the iodometric method must be used. The residue and paper is dissolved with hot, concentrated sulfuric acid and repeatedly treated with concentrated nitric acid solution, fuming to white sulfur trioxide fumes after each addition, until the carbon is oxidized and the solution is almost colorless.

Other oxidants than nitric acid—ammonium persulfate, hydrogen peroxide, etc.—have been suggested but offer little advantage either in speed or convenience. If antimony as well as tin is sought the solution is now cooled and 200 ml of water carefully added, followed by 10 to 15 ml of concentrated hydrochloric acid solution. It is then cooled to room temperature and titrated with a standard potassium permanganate solution. Any stannic ion reductant

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is then added, together with 65 ml of the hydrochloric acid, the flask closed with a stopper holding a bent glass tube extending out over the hot plate and the solution gently boiled for 10 min.

The other end of the tube is inserted in a small flask containing a saturated solution of sodium bicarbonate and the whole cooled to approximately 10°C. A few small pieces of marble are added and it is rapidly titrated with standard iodine solution, starch being used as the indicator. Although it is sometimes stated that an atmosphere of inert gas is necessary during titration for accurate results, our experience, in agreement with others, is that in experienced hands the cumbersome carbon dioxide equipment need not be used.

Electrolytic method used for Cu

The electrolytic method for copper is preferred because of it's accuracy, convenience and the fact that the analyst is not tied to the operation. If all the antimony and arsenic have been removed with the tin oxide precipitate there are no interferences from the elements present in tin bronzes.

Several precautions should be taken. Watch glasses should be used to trap most of the unavoidable spray, particularly when stirring is used to hasten electrodeposition. The solutions into which the electrodes are dipped upon removal—distilled water and alcohol or ether—should be frequently renewed. The copper plate should be dried at 100°C for a few minutes.

Local overheating of the deposit is a common error. Weight of the platinum electrodes should be checked often by heating to cherry redness, plunging into concentrated nitric acid solution and reheating. It is then cooled to room temperature before weighing. Sulfamic acid is preferable as a depolarizer because it is stable and inexpensive. A drop of hydrochloric acid solution to bring out the last traces of copper, as recommended by the Bureau of Standards, is used.

On high pH content, reverse the current

Simultaneous deposition of lead dioxide with the copper is commonly made. Too great a lead content, 9 pct or more, may result in some flaking off of the deposit. In this case it is best to reverse the electrode current so that the high lead is plated on the stationary electrode.

When lead content is small, quantitative results may be secured only in weekly acidic solutions—1 to 2 pct nitric acid plus some ammonium ion. The factor for lead in lead dioxide is empirical because the last traces of moisture cannot be removed and the factor varies with the amount of lead. Lead segregation in the sample accounts for some divergent lead results.

We have seen lead checks of 3.50 to 4.42 pct lead from the same sample. Sampling throughout the material, together with thorough mixing before weighing, will hold the error due to segregation to a minimum permitting more accuracy.

Iron may be determined by many methods. Colorimetric methods are most accurate and are fast. The blank in a colorimetric method is too often neglected despite the obvious presence of traces of iron in most reagents used. Should colorimetric equipment not be available, the iron hydroxide precipitate should be redissolved at least once to diminish any zinc ion entrapment. If the precipitate is to be changed to the chloride, reduced and titrated, the silver reductor seems best for that purpose. At least 30 min. should be allowed for complete precipitation of small amounts of iron hydroxide.

The excellent gravimetric dimenthylglyoxime method for nickel is comparatively slow. At the cost of slightly lower accuracy the nickel dimethylglyoxime and paper may be transferred to a crucible and the latter heated mildly until all the paper chars. It is then given full heat and weighed as nickel oxide. Where the colorimetric dimethylglyoxime method is used, the citric acid reagent should be made up fresh at least once a week, and more often in warm weather, to avoid mold growth.

Remove Fe and Ni to find Zn content

To determine zinc it is necessary to remove iron and nickel. Many claims of high accuracy for methods involving electrodeposition of that element have been made. Experimentation does not support such claims. When it is plated from an alkaline or buffered solution there is a question of resolution or of zinc hydroxide formation. When dried, some of the plate is oxidized. The phosphate method, though slow, is consistently accurate. If the precipitation of the zinc ammonium phosphate is done in hot solution it comes down quantitatively within 30 min. The titrimetric method for zinc (ferrocyanide) is good but the rate of addition of the titrant and the acidity must be carefully controlled.

Analysts often try to determine phosphorus by difference—that is, determine the tin in a tin-phosphorus residue and take phosphorus as the difference. It fails unless 9 pct or more of tin is present in the alloy. The addition of tin to the sample to raise it to 9 pct does not give good results.

Use gravimetric method for phosphorous

Among phosphorus methods the gravimetric determination as phosphomolybdate is most accurate. The volumetric method, involving titration of the precipitate with sodium hydroxide, is almost as accurate in experienced hands. The colorimetric method, while very rapid, is accurate only if conditions are adhered to rigidly.

Sulfur, determined as barium sulfate, invariably runs high when ignited, even though precautions are taken to exclude sulfur from the flame and the air. It is best to filter through a Gooch crucible and dry in an electric oven.

This one's electro-erosive—

Another ELECTRO-MACHINING METHOD Shows Promise

By I. Weber
Chemist
Pitman-Dunn Laboratories Dept.
Frankford Arsenal

An electro-erosive machining method, combining electrolytic and electro-arcing effects, is being developed at Army Ordnance's Frankford Arsenal. Hardness has no effect on cutting time. But thinner wheels, more current, and higher wheel speed, all reduce cutting time. Method can be used for cutting or grinding carbides. Machine now being built will be capable of cutting, tool grinding, boring, and chipbreaker grinding.

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Electro-erosive methods for machining carbides and hard metals can be used for cutting, grinding, boring, shaping, and tapping. Research on electro-erosive cutting and grinding is being done at Army Ordnance's Frankford Arsenal. Primary importance of the method is the fact that unlike mechanical processes, cutting and grinding rates are not affected by the hardness of the material being machined. So industrial diamonds are not needed.

The use of carbide tools and dies in this country is almost entirely dependent upon the supply of industrial diamonds from overseas. The hardness of carbides normally requires that they be ground with diamond wheels. Current extensive use of carbides threatens to create a diamond shortage, and in event of total war this would become serious. Rapidly expanding uses for carbides make it desirable that even in peace time a process to handle hard materials without expensive diamonds be developed.

This necessity has prompted investigation of several new processes, four of which were discussed in a recent National Research Council report (THE IRON AGE, March 20, p. 103). The process designated in the report as electrolytic, was considered in the report primarily in terms of grinding, while the process designated as electroarcing was considered primarily in terms of cutting. The machine developed at the Frankford Arsenal is capable of performing both processes, and promises to be ideal for carbide tool finishing.

Unlike electro-mechanical machining methods, the electrolytic and electro-arcing processes have a cutting tool and workpiece surrounded by an electrolyte rather than a dielectric fluid. The carbide is connected in a dc circuit as the anode, and a rotating metal disc acts as a cathode. Both cutting and grinding may be achieved, depending on whether the carbide is held against the edge or the side of the disc. In this article the results of research on cutting is reported.

The Frankford Arsenal test apparatus is shown in Fig. 1. The mild steel cutting wheel is connected to the negative post of a rectifier, through the shaft of the motor, by means of a commutator and brush arrangement. A work

clamp is attached to a lever arrangement which is completely insulated from the motor by a block of plastic. Work pressure is controlled by a sliding weight on the lever arm. Rectifier output is a maximum of 120 amp at 30 v, dc. The work and lower portion of the cutting wheel are submerged in electrolyte contained in a plastic trough. A plastic shield over the wheel prevents splashing.

In a new model being built the electrolyte will be sprayed over the work by means of a pump and nozzle arrangement. The work will be clamped in a universal vise, and pressure and direction of feed will be controlled by a movable table.

Because of a scarcity of carbide blanks of suitable dimensions, mild steel, 23 Rc, was used for most of these tests. Results were frequently checked with carbide-tipped tools.

One of the first tests performed showed that pressure on the work has no effect on cutting time. Practical considerations of vibration required a certain minimum pressure, and too much pressure jammed the apparatus. But within this wide range, high pressure was not required to get good cutting time.

Sodium silicate best electrolyte

A number of electrolytes and quenching fluids were tested to find the fluid which gave lowest cutting time. Sodium phosphate, sodium borate, sodium aluminate, sodium molybdate, sodium citrate, sodium oleate, and sodium hydroxide were tested. Two non-electrolytes, water and lubricating oil, were included for comparison.

In addition, sodium hydroxide in combination with silicic acid was tested, and this proved to give the lowest cutting time. This combination produces sodium silicate. Sodium aluminate, borate, and citrate, also showed fairly low cutting times. Subsequent tests showed that the cutting time decreased as the proportion of silicic acid to sodium hydroxide increased, and decreased as the specific gravity of the combination increased. For all other electrolytes cutting time increased as the specific gravity increased.

Test results in Fig. 2 show that cutting time decreases as current increases. The curve approaches a level eventually, so that for practical purposes and economy there is an optimum current beyond which there is little point in increasing current.

HARDNESS INFLUENCE ON CUTTING TIME

Specimen	Hardness, Rc	Cutting Time, Sec
1	64.2	70
2	61.0	75
3	54.2	61
4	44.2	69
5	37.0	66
6	24.5	71
		s = ± 4.8 sec

FIG. 1—The test apparatus at Frankford Arsenal includes motor, at right; wheel, covered by plastic shield, at center; and workholder, at right of operator's left hand. Workpiece makes contact with wheel under surface of electrolyte bath.

In Frankford test results, shown in Fig. 3, cutting time decreased as wheel peripheral speed increased, at any value of current. Russian investigators have claimed that cutting time increases as peripheral speed increases. The Russians were working in a speed range of from 30 to 195 fps, while Frankford speeds ranged from 10 to 39 fps. Frankford intends to investigate at higher speeds.

In early tests, wheels were machined on a lathe to a definite thickness and diameter, and were generally shaped to a flat-edged rim. It was found that as a wheel was used, the first 12 to 15 cuts took a fairly long time. Continued use of a wheel usually resulted in a sudden decrease in cutting time to a stabilized reproducible value. Visual examination showed that a bevel was produced on the wheel rim in use. Therefore a wheel was prepared with a machined bevel. With this, cutting time for the first few cuts was lower than before, and stabilization occurred after only about 5 cuts.

Hardness doesn't affect cutting time

The table gives the results of tests of the influence of hardness on cutting time. The cutting times, averaging 69 secs., showed normal dispersion, leading to the conclusion that hardness has no effect on cutting time. These tests were made on carbon tool steel. Similar tests were made on cobalt steel of 65 Rc hardness, with an average cutting time of 31 sec. The difference between the two averages is believed by Russian investigators to follow the rule that resistance to cutting decreases as the atomic weight of the element increases. Insufficient tests have been conducted at Frankford to support or refute this.

When wheels with thicknesses of 0.02, 0.03, 0.04 and 0.05 in. were tested, it was plain that cutting time was much lower with thinner wheels, as Fig. 4 shows. Loss in wheel diameter, for the

Fast cutting gives poor surface—

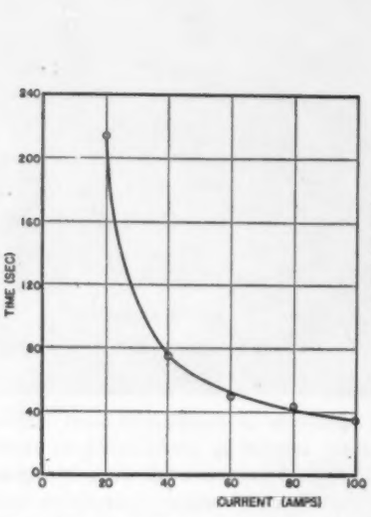

FIG. 2—Plot shows how cutting time decreases with increasing current flow. Curve tends to level out to point where current increases yield little time gain.

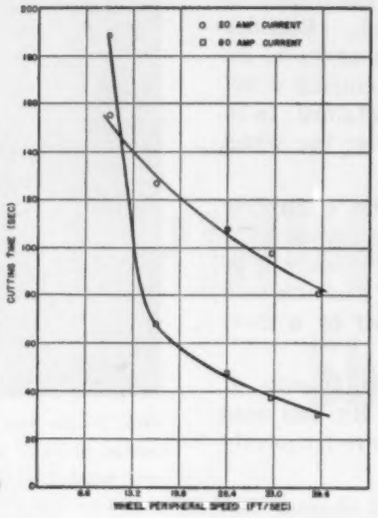

FIG. 3—At two different amperages, cutting time decreases as wheel peripheral speed increases, though the amperage obviously affects the process.

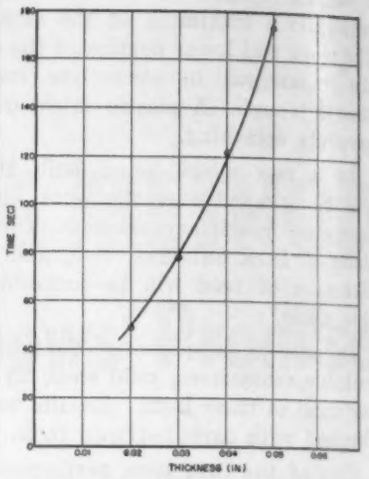

FIG. 4—Thinner wheels cut faster. The cost of making wheels as thin as 0.02 in. is high. But reduced cutting time justifies this. Wheels could be thinner.

same number of cuts, was less with the thinnest wheel than with the others. The thin wheels are difficult to prepare, but are practical from the standpoint of decreased cutting time, low rate of diameter loss, and more economical power consumption. Wheels even thinner than 0.02 in. would be desirable, but are yet impractical.

Sodium silicate, known as waterglass won another test when it proved to produce the thinnest cut, for a given wheel thickness, compared with other electrolytes. This showed it best prevents the arcing effect between the side of the cutting wheel and the side of the cut. The greater this arcing effect, the wider the path cut by the wheel, and the greater the cutting time and unnecessary use of electrical energy.

The process described is primarily intended for high speed shaping of hard metals and carbides, and does not produce a good surface finish. In general, the higher the speed of cutting the rougher the surface. The usual machine shop procedure of grinding or lapping machined parts to the desired surface finish may be practiced after electroarc cutting. In addition, tentative and exploratory experiments in electrolytic grinding indicate that it is possible to obtain surface finishes that are smoother than finishes obtained by usual mechanical methods.

An arc cutting process

It has been concluded at Frankford that the process is predominantly an arc cutting process. If a gap is maintained between the rotating wheel and the workpiece, the only phenomenon occurring is electrochemical, with a deposition of a silicate film over the anodic workpiece. There is no possibility for self-initiated sparkover, since the voltages seldom exceed 20 v. In actual practice, a gap between the electrodes is constantly being opened and closed as a result of natural vibration. At the moment the two electrodes separate, an arc is initiated. It is maintained until quenched either by too large a gap distance or by the sodium silicate solution. The arc is of relatively long duration as compared to a spark, and because the arc has a higher integral temperature, erosion of the anode is predominantly a thermal effect, with flare explosion playing a part.

Silicate film directs arc erosion

The deposited dielectric silicate film is very effective in directing the forces of arc erosion toward the bottom of the cut. The coating stays on the sides, but is removed from the bottom of the cut by wheel contact. Other electrolytes may be used, but silicate is most effective.

A major machine tool builder is manufacturing for the Frankford Arsenal a machine which will incorporate the principles of electro-erosion. It will permit the following operations to be performed: Straight cut off and shaping; straight, radial and form grinding or polishing; boring; and grinding of chipbreakers. Preliminary experiments indicate that, using this machine, ground finishes better than 5 microinch rms will result. The machine has been designed to permit flexibility in all types of grinding and cutting operations. However, the principal use will be in finishing and regrinding of single point tools. The machine will cutoff a chipped or cracked portion of a tool, regrind on three faces to a 5 microinch rms finish or better, and grind in a chipbreaker. It is estimated that the first two operations can be performed in approximately 15 min.

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STEEL MEN MEET UNDER GLOOM OF SEIZURE

Top steel leaders converged on the Waldorf-Astoria in New York last week for the 60th General Meeting of the American Iron & Steel Institute—the first ever held under the shadow of government seizure. Attendance wasn't as large as expected because a number of executives were held near their plants by the explosive labor situation.

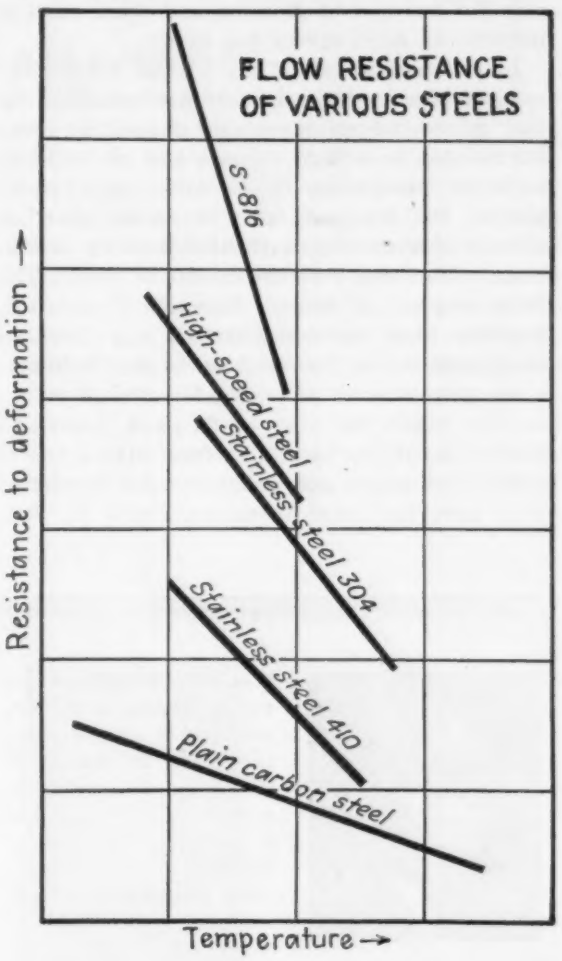
On the surface this meeting was quite similar to those which had preceded it: Good speeches, awards, and technical sessions—and the same genial levity in the corridors between sessions. But, apart from the crowd, old friends spoke quietly, their measured tones always turning to the same subject—the "unholy alliance" between union and government. In the corners there were expressions of disgust, anger and fear from steel people now fully aroused. Bitterness was directed mostly at Administration leaders—a partisan union is taken for granted.

Overshadowed by their struggle to regain control of their properties and their freedom to operate them was some uneasiness over future business. Nearly all believed hard, tough selling competition would be in store for them yet this year. Many representing small or nonintegrated companies, were feeling it already. Some of the members believe that the best approach to labors demands for higher wages might be to give them a good look at the order books for the third quarter.

Of great interest in the technical sessions was a paper by Jerome Strauss, Vice-President, Vanadium Corp. on the Sejournet hot extrusion process. Originally developed in France this method of forming steel is being installed by six American firms under license arrangements. Molten glass which serves as a lubricant and insulator between the dies and the metal is the important factor of the process.

In addition to the extensive research in lubrication carried out in France by Comptoir Industriel D'Etirage and Profilage De Metaux other facets of extrusion were investigated. Mr. Strauss said actual tests run on extrusion pressures for various metals at given temperatures verified the theoretical formulas which had been previously worked out. Mr. Strauss showed graphically the relationship between temperature and deformation resistance of some metals. The graph indicates the wide difference of flow resistance that exists. The combined results of all these experiments now permit the prediction of characteristics needed in various sizes of presses for a number of metals and alloys in a wide range of shapes and sizes.

The speaker said that hundreds of tests show that proper glass vicosity and diffusibility are most important for optimum operations. The original glass plate used has been replaced by fibrous or woven glass and experiments on the lubricating properties of glass and glass-like



Cradled in glass—

substances are being continued.

So far over 1000 different extruded shapes in steels and alloys have been processed in tonnage in France, Mr. Strauss said. It has been found that slight changes in die form alters the movement of the glass lubricant over the die surface. New die designs, some of them contrary to accepted die design principles, have made possible continuous making of complex shapes.

Mr. Strauss called attention to the fact that hot extrusion permits the shaping or working of metals which heretofore could not be worked. "Hot-short" or unmalleable metals have been satisfactorily formed at the plant in Persan, France. He briefly mentioned a few such metals of this type: 29 Cr—9 Ni, high purity molybdenum and S 816 alloy. One important metallurgical characteristic of extruded metals is that there is less difference between longitudinal and transverse properties than for the same metal in the wrought condition.

The speaker illustrated how the movement of metal through the die takes place. The outer surface of the heated billet remains at the surface and is relatively stationary compared to the center which moves forward and is elongated faster than the metal in contact with the die.

Many of the early experiments were carried on a 660 ton press. At present a 1650 ton press is in operation at the French plant and most American installations have presses of about 2500 ton capacity.

Other technical papers . . .

Three methods of recovering manganese from slag dumps of openhearth furnaces have been developed by the steel industry. Shadburn Marshall, the Research and Development Laboratory, United States Steel Co. reported.

An estimated 772,000 tons of metallic manganese is contained annually in openhearth slags the author said, more than enough to compensate for the loss of Russian and other foreign imports, an AISI survey has shown.

In collaboration with the United States Bureau of Mines, steel scientists are investigating the "pyrometallurgical process" of smelting openhearth slag in a blast furnace and oxidizing to separate manganese from undesirable phosphorus, Dr. Marshall said. A second chemical process of ammonium-carbonate leaching, is also being undertaken with the Bureau of Mines. The third process, at Armour Research Foundation, involves both pyrometallurgical and chemical techniques and is sponsored by the steel industry.

As properties of sheet steel improved in the past 25 years, the price of 20 gage, cold-rolled automobile sheets has fallen from $135 a ton to $104, steel wages and products made largely of steel have had large increases, Frank H. Fanning, vice-president, operations, Armco Steel Corp. reported.

Development of wide strip mill equipment was described. Until the first successful mill on multiple length sheets was put in operation by Armco at Ashland, Ky., in the 1920's, there had been little change in the principle of rolling steel sheets from that sketched by Leonardo da Vinci about 1500 A. D.

Production of wide, hot strip became possible, Mr. Fanning reported, as engineers were able to reduce to scientific terms the simple principles practiced by rollers on hand mills for 150 years. Key to the new success was largely in the slightly concave cross section of certain rolls, together with attention to required temperatures and pressures.

Without the new methods of sheet production, the price of 20 gage cold-rolled sheets would be $275 a ton for the hand mill product, according to Mr. Fanning's estimate.

Development of coke oven gas as an efficient steelmaking fuel, an answer to the problem of depreciating oil quality, was described by J. H. Kelley, assistant superintendent, openhearth and

WALTER S. TOWER, who retries as president of the institute after 19 years of service, 12 of them as president. In his address reviewing significant events of the past year he castigated constant harping about steel supply, wondered if controls would end.

ADMIRAL BEN MOREELL, board chairman, Jones & Laughlin Steel Corp., spoke on "The Challenge to American Business." It was packed with examples of what has happened to business in England. "We must be participants in the whole community of our country," he said.

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NEW LEADERS

Walter S. Tower has resigned after 12 years as president of the American Iron & Steel Institute. His resignation was accepted by the board with considerable regret although it had been known that he had decided on retirement some time ago. No successor was named as president. Max D. Howell, vice-president and treasurer, U. S. Steel Corp., was elected to the new post of executive director of the institute and continues as its treasurer.

Benjamin F. Fairless and Frank Purnell were re-elected vice-presidents; George S. Rose continues as secretary. New directors are: Robert S. Lynch, president, Atlantic Steel Co., and Alwin F. Franz, president, Colorado Fuel & Iron Corp.

AWARD WINNERS

"The Significance of Air Temperature in Openhearth Operation," a paper given before the Institute last year, won for John S. Marsh the American Iron & Steel Institute Medal. Mr. Marsh is a research engineer with Bethlehem Steel Co., Bethlehem. A specialist on manganese and desulfurization problems, Mr. Marsh's paper discussed the relation of air temperature to the time required to make a heat of steel.

For his paper describing Armco Steel Corp.'s revolutionary method of delivering steel to its new openhearths, L. F. Reinartz, Armco vice-president, won the Regional Technical Meeting Award. The award, a stainless steel plaque, was given for Mr. Reinartz's paper in Chicago last fall.

bessemer department, Sparrows Point Plant at Bethlehem Steel Co.

In developing the fuel, a self-imposed time limit required the openhearth department burn 70 pct coke gas within 2 years with no loss in steel production. This involved developing a more practical burner, methods of handling new fuels in combination, instrumentation, and quickly training personnel to a new type of furnace operation.

Desulfurized coke gas, supplied at right pressure and used properly with a small amount of tar, gives an ideal openhearth fuel from coal alone and can no longer be considered an inferior fuel, Mr. Kelley reported.

Hundreds of items of plate, involving wide variations in steel composition, temper, thickness, and size and weight of tin coatings are needed to fill the requirements of the modern can factory, Charles A. Ferguson, general superintendent, Gary Sheet and Tin Mill, United States Steel Co., explained in a report, *"Changes in the Processess and Products of the Tin Plate Industry."*

The "tin can" is about 99 pct steel. Some 5.3 million tons of steel, 7.5 pct of finished steel production in the United States, went into tin mill products in 1950.

One modern hot strip mill is rolling 350 to 400 tons of steel an hour. Optical pyrometers, electric eyes, width and X-ray thickness gages help bring the strip through the mill and into coilers at desired temperatures, width and thickness.

Introduction of cold reduction for tin mill products in 1929 enabled the industry to use steels with better ductility to meet more severe fabricating requirements, and still more important, greater corrosion resistance.

A continuous annealing at Gary Sheet and Tin Mill cleans and anneals continuously at a top speed of 1000 ft a minute.

Blackplate, a thin sheet without coating, is gaining wider use in the container field. Intensive research is being directed toward developing nonmetallic coated blackplate that will compete in quality with tinplate in many uses.

and a warning . . .

With space opening up on mill schedules, a note of caution was in order. William M. Akin, who heads Laclede Steel, a semi-integrated mill, sounded the warning. The steel industry will be a lot more choosey in the next few years on what, where and how it builds, he declared. The next generation of steel executives, when it sweats out bonds for present expansion, may wonder why $2 was spent where $1 would do most of the work. He suggested that plants built to last 100 years may at that time be on processes going the way of the fagot mill and the puddling furnace. And he thinks the industry may be a bit over-engineered as well as overbuilt.

EDGAR C. BAIN, vice-president, U. S. Steel Co. delivered the Charles M. Schwab Memorial Lecture, backing it with tremendous research that traced the development of science in the steel industry from 1350 B.C. And he predicted some things to come.

MAX D. HOWELL, vice-president and treasurer, U. S. Steel Corp. who assumes the new position of executive director of the American Iron & Steel Institute. He will continue to serve as the institute's quiet, efficient treasurer.

Cool them off—

HEAT ABSORBING GLASS Stops Radiation Rays

By E. C. Miles
Technical Service Engineer
Pittsburgh Plate Glass Co.
Pittsburgh

Operators in steel mill crane cabs and rolling mill pulpits can be protected by a heat absorbing glass. The glass, which also shields the operator from injury by heavy scale and molten splash, intercepts and absorbs certain wavelengths of radiant energy. It stops intense infrared radiation from open furnaces and hot ingots. Operator efficiency is improved without impairing visibility.

Heat absorbing glass in steel mill crane cabs and rolling mill pupits protects operators from the intense radiation from hot ingots and open furnaces. Such glass, developed originally for use in connection with artificial light sources, also gives protection from injury by heavy scale and molten splash while permitting clear visibility during mill operations. Typical installations is shown in Fig. 1.

Need for a heat absorbing glass to intercept infrared radiation was voiced nearly 20 years ago by the Illuminating Engineering Society. A heat absorbing glass meeting the necessary specifications was developed by Pittsburgh Plate Glass Co.

Broadest utility required a glass with a luminous transmittance of from 70 to 75 pct and a total solar energy transmittance of about 45 pct. Greater absorption of solar energy is undesirable because about 50 pct of radiation reaching the earth lies in the visible wavelength range between 400 and 750 millimicrons. Solex glass was designed to include these transmission and absorption qualities.

Fig. 2 shows the percentage of transmission for regular plate glass and for Solex throughout the wavelength range from 300 to 2800 millimicrons as well as relative radiation intensity at various wavelengths for a black body at 1500° Kelvin (2240.6°F). Approxiate rolling temperature of a hot steel ingot is 1500° Kelvin. By far the greater proportion of radiation from

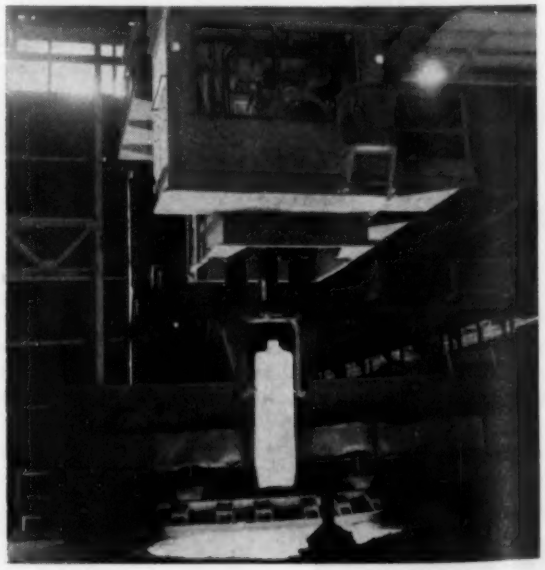

FIG. 1—Heat radiation from soaking pit and hot ingot is absorbed by Solex glass which makes up the floor and walkway of air-conditioned cab at Allegheny Ludlum Steel Corp.

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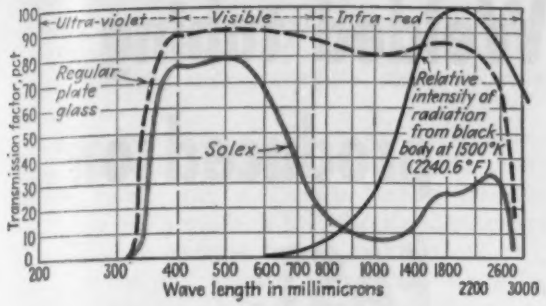

FIG. 2—Percentage of transmission for regular plate glass and heat absorbing glass is compared.

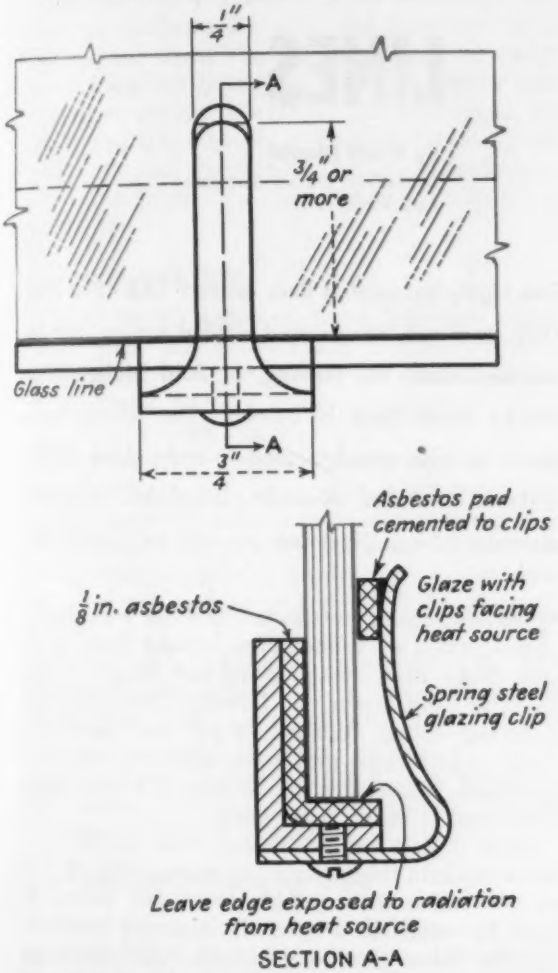

FIG. 3—Mounting shown provides adequate room for expansion and contraction and avoids undue stresses in glass.

a hot ingot occurs at wavelengths where the transmsision of Solex is very low, or where it is opaque as in the region beyond 2800 millimicrons. Consequently, Solex transmits directly less than 20 pct of the energy from a hot ingot as compared to about 45 pct of total solar energy.

In the case of molten steel the temperature may be on the order of 1800° Kelvin (2780.6°F) and the greatest radiation intensity would occur at about 1500 millimicrons. As indicated by the transmission curve in Fig. 2, Solex still absorbs

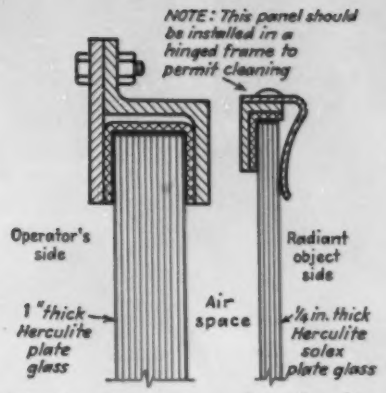
NOTE: This panel should be installed in a hinged frame to permit cleaning
Operator's side
Radiant object side
1" thick Herculite plate glass
Air space
1/4 in. thick Herculite solex plate glass

FIG. 4—Protection from heavy scale and molten splash is provided by installing an additional panel of tempered glass.

and reflects about 80 pct of the energy from a source at 1800°K.

Intense infrared radiation causes discomfort, lowers efficiency, and is injurious to the eyes. While no type of glass can be guaranteed against breakage, such difficulty can largely be avoided by using the right kind of glass properly installed.

Regular annealed Solex is heat absorbing. It intercepts and absorbs certain wavelengths of radiant energy and thereby acquires a higher temperature. Because of this property it is more susceptible to damage by heat than regular plate glass. Both types of glass, however, can be tempered to acquire heat resistance.

The tempered material, Herculite Solex, is 4 to 5 times stronger than the annealed glass It withstands sudden temperature changes as great as 400°F, and may be operated at temperatures up to 550°F without appreciable loss of strength.

Panels should be glazed into an asbestos insulated rabbet so that the side of the glass next to the heat source will be exposed all the way to the edge except for a minimum number of small clips used to retain the glass in the rabbet. These retaining clips should contact the glass about ¾ in. from the edge, and should be kept from direct contact with the glass by inserting an asbestos spacer.

A suitable mounting is illustrated in Fig. 3. Almost any construction which provides adequate room for expansion and contraction and prevents the edges from becoming substantially cooler than the remainder of the panel will avoid undue tensile stresses and minimize the hazard of breakage.

In some cases it is necessary to protect workers from injury by heavy scale and molten splash. A partial cross section of an installation designed to provide such protection is shown in Fig. 4. A heavy panel of tempered plate glass having normal transmission characteristics is installed between the heat absorbing panel and the operator. The lighter frame should be hinged to facilitate cleaning of glass surfaces between the two panels.

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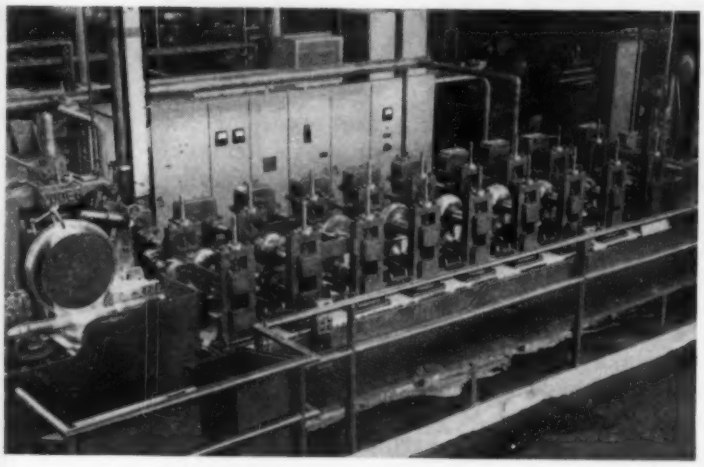
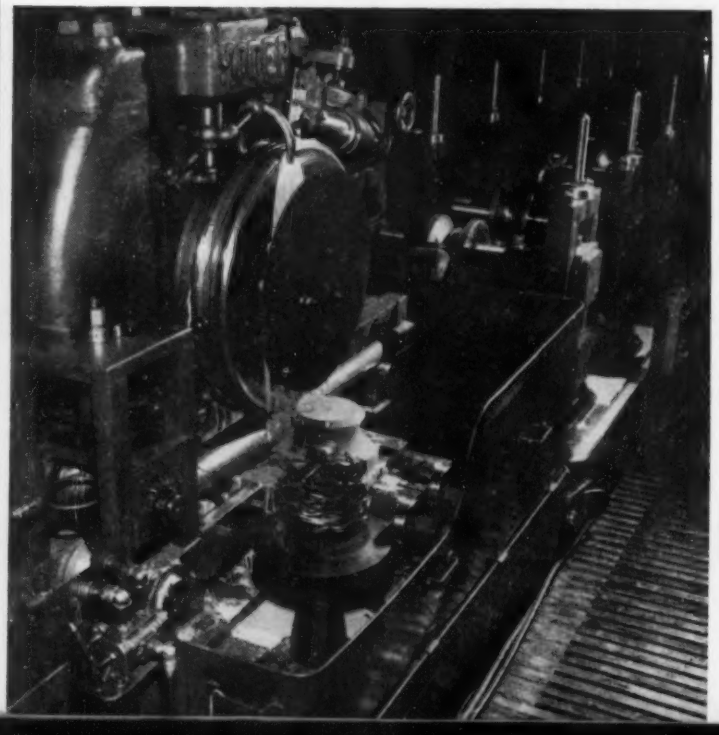
DRIVEN COIL BOX feeds and flattens stock to pull-in rolls of one of two big welded tube mills at Ford Motor Co.'s Mound Road Plant, Detroit. Coils are welded end to end.



FORM ROLLS of giant tube mill pull and shape coiled steel into tubing used for passenger car rear axle housings. Second mill makes tubing used for drive shafts.

TUBE IS WELDED and flash removed automatically by this unit. Flash winds on reel as it is cut from tube.



Welded tubing produced on FAST, AUTOMATIC LINES

By Frank Manor
Production Process Engineer
Ford Motor Co.

Two highly automated lines convert SAE 1010 and 1020 steel coil into finished welded tubing, cut to size and ready for forming, at Ford Motor Co.'s Mound Road Plant in Detroit. The tubing, produced at high speed, is used to make drive shafts and rear axle tubes. Annealing is included for larger diameter tubing. Diameters are held to ± 0.010 in.

Two new, highly automated lines for continuous production of welded steel tubing from steel coils have been installed at the Mound Road Plant of Ford Motor Co., Detroit. The tubes are delivered cut to finished length and annealed, ready to be formed into drive shafts or rear axle housings. Heretofore full lengths of tubing were purchased to make these parts.

Coils of steel are fed through mills which form the strip into tubes, weld the seam, trim off OD of weld flash with carbide tools, roll down ID flash by means of a specially designed mandrel, cut the tubes into long lengths and discharge these onto the inclined tables of the Duncan-McKay machines that face and chamfer both ends. This process is identical on both mills.

The first and smaller mill makes 2¾ in. OD tubing for drive shafts. Fully hard SAE 1020 cold-rolled steel, 0.062 in. thick, is used. Two coils averaging 3000 lb each are set on edge in a rack to feed the tube machine.

Stock feeds through flattening rolls and a station where a Heliarc machine welds the tail end of one coil onto the lead end of the next coil. The stock passes into the Yoder mill that forms it to tubular shape. The tube feeds into a 200-kva 180 cycle welder that produces the continuous weld. As the tube advances beyond the welder, a

carbide tool cuts away the flash from the outside of the weld and the flash winds up on a reel. Then the tube runs through a stand of three sizing rolls.

On the mill runout table an automatic flying cut-off is picked up by the advancing tube. Each length drops onto a Duncan-McKay transfer table and into a machine that faces and chamfers the two ends, holding overall length to 25 ft 6 in. ± 0.005 in., enough to produce six drive shafts. This length is then shifted into a machine where it is automatically fed over a mandrel to a fixed stop.

Here the tube is locked and cut to length by an automatic eccentric cutoff, after which the stop is lifted momentarily until the piece cut off is pushed on. Then the stop picks up the newly cut end and the cycle repeats until the entire tube is cut into six shaft lengths. The latter feed, via chute and conveyer, to a loading fixture. Each length is fed through a Sutton straightener. Variation from true straightness is held below 0.020 in.

End up in tote box

From the straightener, tubes feed onto a conveyer, then into a tote crate. Crates rest on a roller conveyer at floor level and can be picked up as needed by fork trucks. Production rate is 575 finished tubes per hour.

All motors on the tube mills are variable speed dc type. Each mill is supplied with water for cooling the weld and this water drains into a tank from which pumps return it through a heat exchanger to the mills as needed. A separate supply of water is used to cool the welding transformer.

Axle tubes, of 4½ in. OD are made from SAE 1010 cold-rolled steel 0.125 in. thick on a 5-in. Yoder mill. This larger machine uses 60 cycle current to supply its 600 kva welding unit. Three additional sets of rolls size the tube subsequently and insure a true cylindrical shape. Outside diameter is held up to 4.500 in. ± 0.010 in.

Two annealing furnaces used

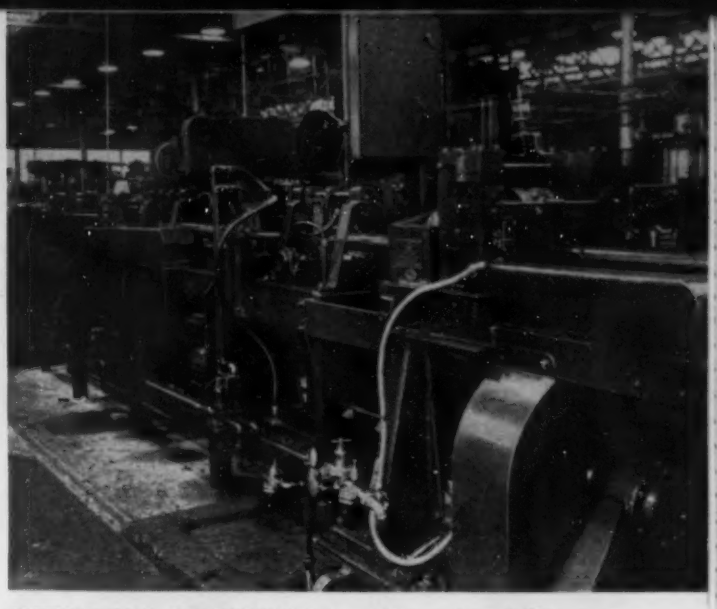
Two Surface Combustion annealing furnaces, each about 120 ft long are used. Approximately half the length is for heating the tubes to 1700°F and the remainder for cooling. A DX generator supplies the annealing atmosphere which prevents scale formation. Each tube remains in the furnace about 26 min.

Operated 24 hrs a day, the two mills can produce about 10,000 propeller shaft tubes and 14,000 axle tubes.

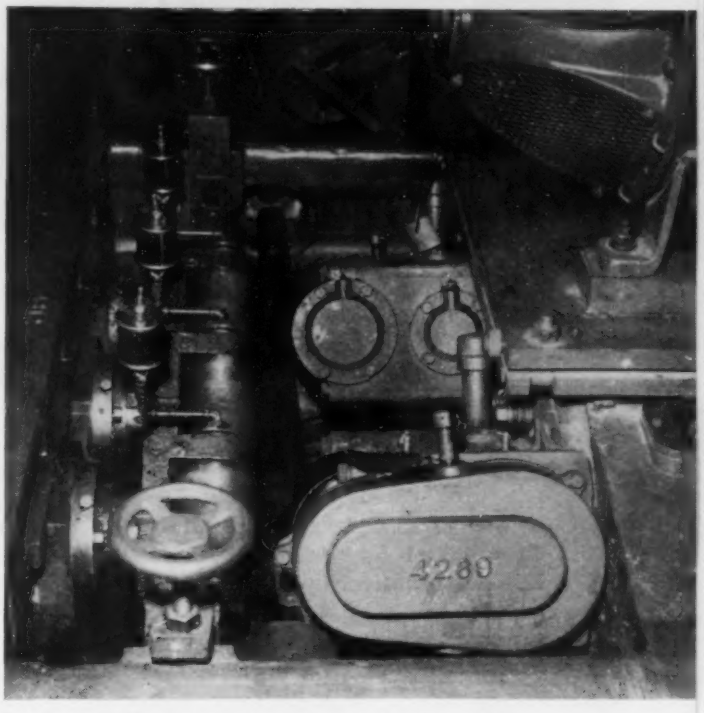
The crew performs almost no manual labor, but keeps watch to see that the machines and transfer devices perform as required.

At intervals, cut lengths of tubes are tested for weld strength.

Presently these mills are producing tubing for drive shafts at the rate of 105 ft per min and axle housing tube at 70 ft per min.

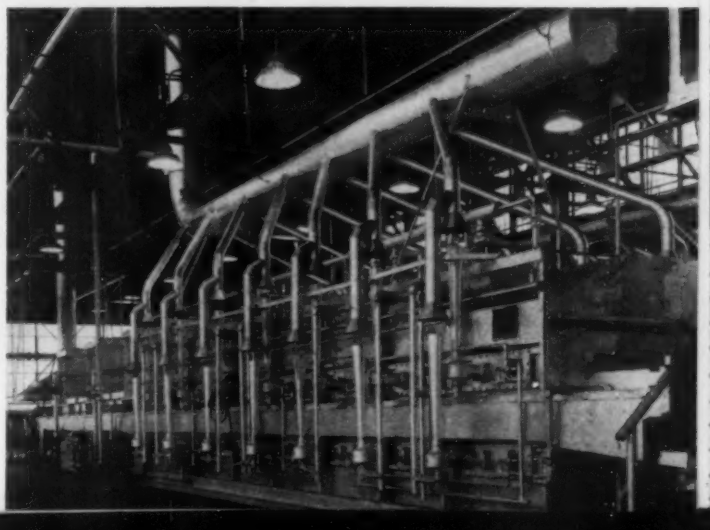


CUTTING AND STRAIGHTENING machine automatically cuts the newly made steel tubing into proper lengths.



CUT TO LENGTH stock—piece shown is for drive shafts—goes through Sutton straightener. Variation from true straightness is held below 0.020 in. Stock is handled by conveyers.

GAS-FIRED FURNACE is one of two Ford uses to anneal larger tubing in preparation for forming operations.



Apprentice HEAT TREATER STANDARDS Adopted

Standards of apprenticeship for the heat treater trade have been formally adopted by the Metal Treating Institute. The standards were developed by the Institute in cooperation with the Bureau of Apprenticeship of the U. S. Dept. of Labor.

Acceptance of the standards marks completion of the work of the apprenticeship committee named by the Institute at the annual meeting held in Detroit last year. A. M. Cox, president, Pittsburgh Commercial Heat Treating Co., Pittsburgh, was chairman of the committee. Thomas F. Kenney, regional director, Philadelphia, of the Dept. of Labor's Bureau of Apprenticeship, assisted the committee.

The 4-year apprentice training program, when in operation, will answer the need of industry for a flow of trained technicians into an increasingly important field of metal processing. The apprentice training program is expected to help fill the gaps caused by Selective Service. Acceptance of the apprentice program has also aided in classification of the heat treating trade as a critical labor field by the Labor Dept.

Scope of the program, see below, will be broad, providing extensive training in all principal phases of heat treating. The trainee will be on probation for the first 500 of the 8000 hours of his apprenticeship. Regular training will be supplemented by 144 hours of related class instruction each year.

APPRENTICE HEAT TREATER PROGRAM

WORK PROCESS	HOURS
Salt Bath (Assistant)	500
Salt Bath Heater	600
Large Furnace (Assistant)	1000
Large Furnace Heater	1000
Straightening	600
Tool and Die Hardening (Assistant)	1100
Tool and Die Hardening Heater	1100
Inspection	1100
Office	1000
TOTAL	8000
Related Subjects Required	
Chemistry of Iron and Steel, elementary	
Stress and Strain of Materials, elementary	
Physics	
Applied Mechanics	
Physical Metallurgy	576

While related class instruction amounts to only 144 hours each year, the subject matter is an important part of apprentice training. Related subjects will include elementary chemistry of iron and steel; elementary stress and strain of materials; physics; applied mechanics; physical metallurgy. Time spent in classes is not, however, considered hours of work and the company is not required to pay wages for this time.

Much time and money go into the training of the apprentice heat treater. In return, the apprentice is expected to apply himself diligently and to show due consideration for equipment. While the apprentice will get systematic instruction in all branches of the art, his work schedule remains flexible and will be tailored to the shop production schedule.

Guiding trainees will be a supervisor of apprentices in each company. His job is to keep progress records. He makes sure the apprentice is getting the proper experience and his reports reflect the apprentice's skill and aptitude. The apprentice who shows unusual aptitude and skill may be granted advanced standing. With the advanced standing goes a higher wage rate.

Before the end of each wage period each apprentice will be given an examination. If necessary, the company may require the apprentice to repeat a portion of his training (not in excess of 225 hours) in each period. At the end of 225 hours if the apprentice hasn't shown marked improvement, the apprentice agreement may be suspended.

The apprentice's working hours will be the same as for other employees. Wages will be based on the basic rate paid journeymen heat treaters, with increases in pay at the end of every 1000 hours of work.

To assure proper training, there will be one apprentice to each journeyman, and one additional apprentice to each five journeymen.

At the end of his training, the apprentice is again tested to prove his qualifications to handle the responsibilities of a journeyman heat treater. He receives a certificate of completion of apprenticeship.

Copies of the standards may be obtained from the Metal Treating Institute, 27 North Ave., New Rochelle, N. Y., or from the Bureau of Apprentice of the U. S. Dept. of Labor.

UNIVERSITY OF MICHIGAN LIBRARIES

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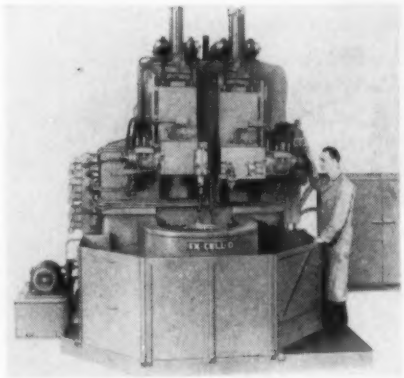
NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 101 or 102.

Reel holds 40,000 lb coil of stock

Automatic centering reels handle coils weighing up to 40,000 lb and 90 in. wide. To load the spindle-type reel, coil supporting arms are expanded and contracted by hydraulic actuated cams within the spindle. As spindle sleeve is pulled toward the frame, the arms expand until the coil is gripped tightly. Simultaneous expansion of the arms centers the coil. The loading car is advantageous in loading coil on reel. *F. J. Littell Machine Co.*

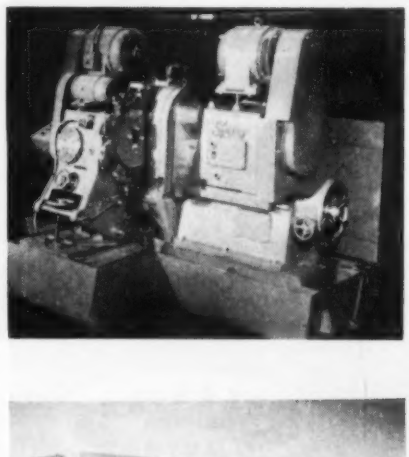
For more data circle No. 18 on postcard, p. 101.



Vertical boring machine features versatility

Multiple precision boring, turning and facing operations are functions of a new automatic vertical precision boring machine. Operations can be performed in a choice of automatic cycles which include automatic changes in work spindle speeds. Heavy cast iron base supports a column on which two vertical slides are mounted. These are counter-weighted and operated by large hydraulic cylinders for smooth performance. Large parts are easily loaded on the 36-in. diam table, which is supported on a vertical spindle. Spindle has speed range up to 500 rpm including speeds to machine aluminum. Automatic functions include all slide movements, lubrication and coolant control. *Ex-Cell-O Corp.*

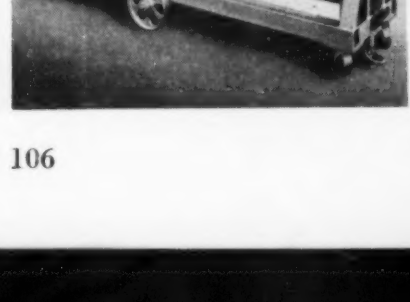
For more data circle No. 19 on postcard, p. 101.



Machine grinds two flat opposing surfaces

A duplex face grinder will grind in one operation two flat opposing surfaces within close tolerances and on a production basis. Two 24-in. grinding disks are mounted on horizontal spindles with their cutting faces substantially parallel, so that workpieces passed between them will have their opposite faces ground simultaneously. Each wheelhead is independent, and is adjustable to or from the opposite head by increments of 0.0001 in. Automatic or semi-automatic feeds can be used on the machine. Grinding disks are 24 in. diam x 3 in. wide with 16-in. hole. Maximum distance between faces is 11½ in. *Arthur Scrivener, Ltd.*

For more data circle No. 20 on postcard, p. 101.



Tilt top truck solves positioning problem

A means required for positioning large broach holders for certain maintenance operations resulted in the construction of the Portelvator tilting top truck. The table top, 24x96 in., rotates 360° on a horizontal axis and can be locked in place wherever stopped. Back plate supports broach holders and fixtures as table tilts work to convenient position for service. Table service is 30 in. from floor. Truck rides on two wheels and four casters for easy maneuverability in restricted space. Floor locks prevent unwanted movement. Capacity is 3000 lb. *Hamilton Tool Co.*

For more data circle No. 21 on postcard, p. 101.

UNIVERSITY OF MICHIGAN LIBRARIES

New Equipment

Continued

Wetting agent

Alconox, a wetting agent and detergent, cleans and brightens porcelain, metal and plastic equipment, and laboratory glassware. It will produce abundant lather in water of any degree of hardness, without forming insoluble calcium film. It is non-poisonous, odorless and non-irritating to skin and tissues. *Alconox, Inc.*

For more data circle No. 22 on postcard, p. 101.

Crane cab windows

Maximum clarity and safety are claimed for crane cab windows made of CR-39 plastic sheets. CR-39 plastic has high resistance to impact, chemical action, and the spatter of molten metals. Sheets in standard sizes from 36 x 48 in. to 46 x 96 in. and in thicknesses from 0.20 to ½ in. are available from *Cast Optics Corp.*

For more data circle No. 23 on postcard, p. 101.

Arc welded diaphragms

Factory facilities for making arc welded diaphragms of extremely thin stainless steel, Ni-Span C, and phosporous have been announced. Diaphragms from 0.0015 to 0.005 in. thick for pressure transducers, pressure elements, and seals for applications in the instrument and aircraft industries are being arc welded. *Bristol Co.*

For more data circle No. 24 on postcard, p. 101.

Fixture lock

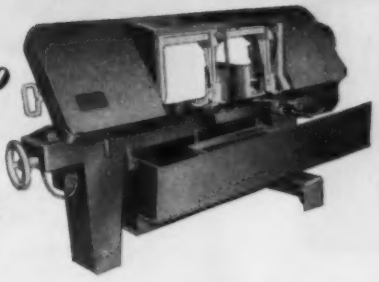
A screwless, quick-acting locking device for adapting to jigs and fixtures does away with slow screw type clamps and holding tools. A simple push or pull on the bar knob sets the device at any position between fully open or fully closed. A light press on the locking lever gives an extra forceful forward motion to the bar exerting a holding pressure up to 1500 lb. The Heinrich Grip-Master fixture lock is adaptable to machining and assembling operations using metal, wood or plastic stocks. *National Machine Tool Co.*

For more data circle No. 25 on postcard, p. 101.

Turn Page

GET ACCURACY that SAVES STOCK . . .

. . . get *Kalamazoo* METAL CUTTING BAND SAWS



Here's *real* precision metal sawing that cuts waste to a minimum, saves hard-to-get stock. *Kalamazoo* Band Saws cut bars, rounds, flats, angles, odd shapes to within a few thousandths of size. What's more, there's an absolute minimum of kerf and *no* burr.

You can get Kalamazoo Metal Cutting Band Saws in three sizes . . . for cutting 6" to 12" rounds. 6" x 10" to 12" x 20" flats. Each model can be had with coolant system for continuous cutting. Each is available with casters for complete portability. Write for details on the many exclusive *Kalamazoo* features that spell *better cutting at lowest cost to you.*

MACHINE TOOL DIVISION

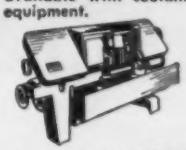
Kalamazoo TANK and SILO CO.

516 HARRISON ST., KALAMAZOO, MICHIGAN

Remember . . . there's a *Kalamazoo* Metal Cutting Saw to fit your exact needs

Model 610 cuts 6" round and 6" x 10" flat. Coolant equipment available.

Model 816 cuts 8" round and 8" x 16" flat. Model 824 cuts 8" round and 8" x 24" flat. Both models are available with coolant equipment.



Heavy-duty Model 1220 cuts 12" plus on rounds and 12" x 20" flat. Available with or without coolant equipment.

"New Process"
Punches • Dies • Rivet Sets
Compression Riveter Dies
Made to highest standards and uniform quality thus insuring maximum service.
Since 1903
Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment.
Square, rectangular, oblong and elliptical shapes made to order.
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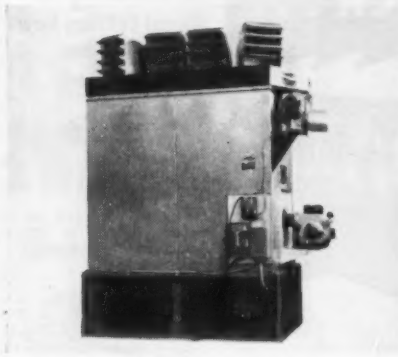
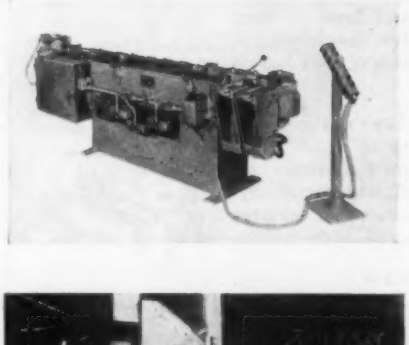


Space heater produces 2 million Btu per hr output

New model Thermobloc designed for large industrial applications will heat an area from 16,000 to 24,000 sq ft. Twin heat exchangers arranged in V form result in maximum scrubbing of the heating surfaces by air passing through. For discharge, diffusers give pin-point control of air throw. Outlets may be placed in any position desired; can be rotated 360°. The unit can use light fuel oil with a pressure atomizer gun-type burner; heavy oil, using horizontal rotary cup burner; gas, using a power burner. It may also be equipped with a combination burner for instantaneous conversion of gas to oil or oil to gas. *Prat-Daniel Corp.*

For more data circle No. 26 on postcard, p. 101.



Tube bender features versatile operation

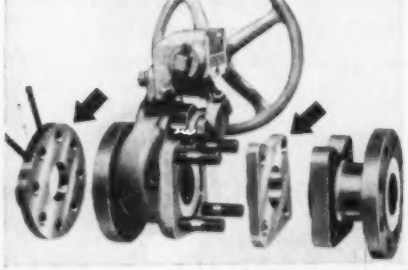
New operating circuit of an aircraft tube bender permits individual control of all functions. Pushbutton control panel enables the operator to stop, start, or reverse the cycle at any given point. Mandrel, clamp die, and pressure die operate automatically or independently. Tooling results can be checked easily at any given point. A workpiece can be formed, checked, and replaced in the bender for an additional 2° or 3° bend. *Pines Engineering Co.*

For more data circle No. 27 on postcard, p. 101.

Cleaning barrel maintains high efficiency

A new Rotoblast barrel aims at improving cleaning operations while reducing abrasive loss. A new work conveyer is driven by a hardened steel chain and uses special cast ductile iron slats which will not pinch the work. Drive is by V-belts to spur gear reducer mounted directly on work conveyer shaft. When barrel is operating, conveyer travels upward to tumble castings. Automatic throw-out torque arm disengages barrel drive in case of jams. Abrasive-tight door and housing permit economical use of new types of abrasives. Abrasive is conveyed up to top of machine to a separator where sand and spent abrasive are drawn out and good abrasive drops down to storage container for re-use. Quick-acting loader delivers entire load into the machine. *Pangborn Corp.*

For more data circle No. 28 on postcard, p. 101.



Heated valves keep mechanisms clear of frost

Electrically-heated valves keep valve mechanisms clear of frost and ice in liquid carbon dioxide lines at temperatures as low as −110°F. Heating elements transmit heat directly to the valve seats, and as a result, heat the entire flow opening through the valve, in addition to the operating mechanism. Sizes from 2 to 6 in. are available, with pneumatic, hydraulic, solenoid or manual control. Heating elements provide 110 or 220 v operation; inputs, 400 to 3000 watts per unit. *Okadee Co.*

For more data circle No. 29 on postcard, p. 101.

Device measures ball bearing torque

With a new tester, complete ball bearing torque information is obtained in less than 2 min. The device measures torque transmitted through small instrument ball bearings under thrust loads. It is able to show how the torque of a small ball bearing varies as a function of angular position during a continuous slow rotation in either direction. Many manhours of assembly and disassembly can be saved by making possible the detection of dirty or defective bearings before installation. *General Electric Co.*

For more data circle No. 30 on postcard, p. 101.

Angle-head drill

Close quarter drilling is easier with new ½-in. pneumatic angle drills. Angle head can be swiveled to any position relative to the throttle by loosening a single nut. The result is all-around maneuverability and general operating flexibility. Housing is aluminum alloy. Built-in regulator allows for variable speed ranges. *Mall Tool Co.*

For more data circle No. 31 on postcard, p. 101.

Supply pump

Easier handling of paints and materials by plant maintenance departments is provided by a new Paintmaster spray gun supply pump. It works directly from 5 or 10 gal original containers and can be used as a portable sprayer with the Sta-Level hand truck. One man easily handles the Paintmaster. Agitator keeps materials perfectly mixed independent of paint pump operation. *Gray Co., Inc.*

For more data circle No. 32 on postcard, p. 101.

Cold cement

Reheading polishing wheels and abrasive belts is possible with a new cold cement that the manufacturer claims can be used successfully on grains from 20 to 320. Grip Grain requires no special preparation to salvage worn out belts or wheels. No heat is required for drying. Adhesive action of Grip Grain locks emery grain to the surface and is odorless. Sample for testing purposes is available without cost. *Schaffner Mfg. Co., Inc.*

For more data circle No. 33 on postcard, p. 101.

Floor hardener

An improved liquid treatment hardens and dustproofs concrete floors to withstand extra heavy trucking. The colorless liquid is reputed to change the chemical structure of concrete on which it is applied, forming a dense, nonporous, flint-like surface. It is applied by brush or mop. *Monroe Co., Inc.*

For more data circle No. 34 on postcard, p. 101.

Turn Page

AT YOUR SERVICE 2 NEW Shenango bulletins

. . . on symmetrical or annular parts, ferrous and non-ferrous

IF your plans call for bushings, liners, sleeves, rings, rolls, or *any* essentially symmetrical shape, find out about the many advantages you stand to gain with Shenango centrifugally cast parts.

BULLETIN NO. 150 covers nonferrous parts in manganese and aluminum bronzes, red bronzes, brass, Monel Metal and special alloys.

BULLETIN NO. 151 covers parts of Meehanite Metal, Ni-Resist and special iron alloys.

These new bulletins show typical Shenango produced parts that are saving time, trouble and cost in industries everywhere. Get the facts. Either or both bulletins are yours for the asking.

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
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SHENANGO
ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL

WHY BESLY-TITAN "Job-Fitted" WHEELS are the Key to Greater Grinding Efficiency

Here's the master key to top efficiency in grinding operations: *Besly-Titan is set up to supply the right wheel for each job,* as you need it, when you want it, at no higher cost than stock wheels!

As the tumblers in a lock yield to just one key, only one set of specifications in the grinding wheel will get *best* results. It is the differences in iron or alloy, quantity of stock removed, type of grinder, results wanted from grinding, etc., that prevent one "key" from fitting job after job. Changed specifications in the work call for changed specifications in the wheel used.

Besly-Titan is organized to diagnose your needs, prescribe the "Job-Fitted" wheels that will perform best on a given job, and supply you on a few-days-delivery schedule. Use the coupon below, or write, to secure all details on formula recommendations and Trial Order Plan.

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☐ Please send details of Besly-Titan "Job-Fitted" Wheel Service.

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Name_____
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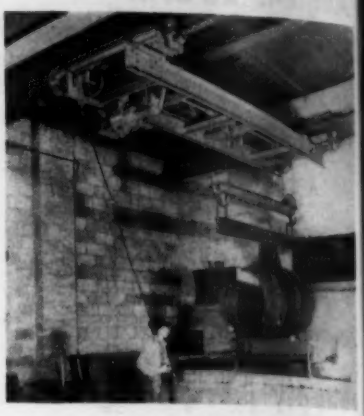

One-man operation

This is an application of a 3 ton Electrolift twin-hook hoist mounted between the end trucks of an American MonoRail crane. The hoist has a lifting speed of 24 fpm with a 6-ft spread between hooks. Special anchor type hooks furnish quick engagement with the hairpin hooks carrying a load of wire coils. The crane has rubber wheel drive for propulsion on the craneway at 125 fpm. All movement is controlled from the pushbutton station in the operator's hands. Other advantages include minimum space requirement; efficient use of tank capacity and elimination of damage to tank lining. *American Mono-Rail Co.*

For more data circle No. 35 on postcard, p. 101.

Two cycle engine

Key to construction of a new two cycle engine is the Uni-Casting of the engine casting with the cylinder head, cylinder barrel, crankcase and main bearing cast in one piece. In cast iron the engine will weigh 10 lb and in aluminum, 7 lb. The engine has no carburetor, but utilizes a fuel ejection system. It is designed as a slave unit; can be bolted to the unit it is to drive in any position, horizontal or vertical. Vaporization takes place in the crankcase and, aided by movement of parts, is reportedly so complete that tendency to choke up on carbon is eliminated. *Plan-O-Mill Corp.*

For more data circle No. 36 on postcard, p. 101.
Turn to Page 114

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for the "BENDS"

WITH MATCHING TANGENT KNOCKOUTS —STRAIGHT, NEAT CONNECTIONS

Square D's new tangent arrangement provides ½"-¾" concentric knockouts with larger knockouts in a tangent pattern. The common center of the two smaller knockouts is a constant distance from the rear of the enclosure. This automatically positions the tangent pattern, thus insuring matching knockouts regardless of size of cluster or device rating.

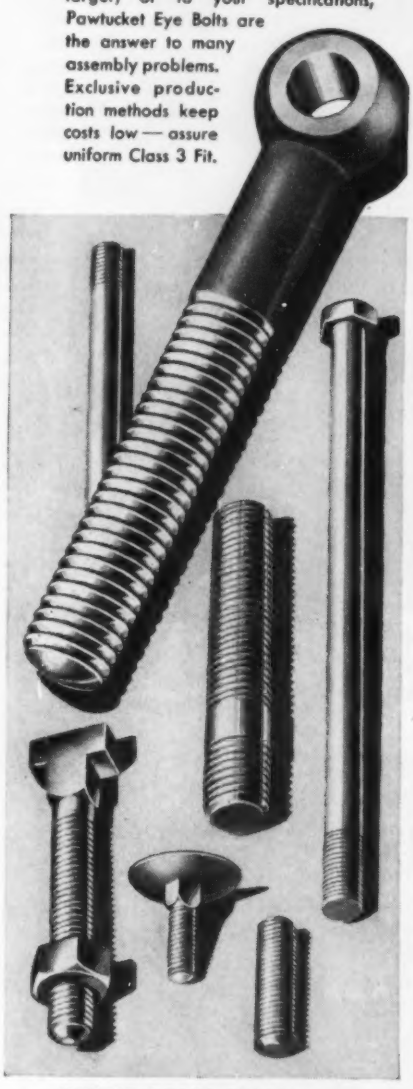
Economical—Attractive!

More good reasons for specifying Square D's electrical distribution and control equipment, straight across the board—less expensive to install and more attractive in appearance.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

Looking for specialties?
EYE BOLTS

Accurately made in sizes ¼" and larger, or to your specifications, Pawtucket Eye Bolts are the answer to many assembly problems. Exclusive production methods keep costs low — assure uniform Class 3 Fit.



BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners for Economy and Reliability

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"THE BOLT MAN"
MANUFACTURING COMPANY
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THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

UNIVERSITY OF MICHIGAN LIBRARIES

—New Equipment—

Continued

Flux crusher

Fused welding flux from arc welding operations can be reclaimed easily with a crusher that removes tramp iron and grinds the flux for reuse. The crusher is satisfactory for small or large scale automatic welding operations. Hardened steel screen plates, manganese steel crusher hammers and alloy cast iron crusher chamber are highly resistant to abrasive effects of fused flux, assuring economical operation. Unit grinds from 1500 to 2000 lb per hr. *Robert Holmes & Bros., Inc.*

For more data circle No. 37 on postcard, p. 101.

Cleaner-sanitizer

Personal safety equipment — face-shields, respirators, mask face-pieces, ear defenders, clothing—can be cleaned and sanitized thoroughly, quickly and with ease by use of new MSA cleaner-sanitizer. It is a dry powder—25 1-oz envelopes to a carton—safe and convenient to handle. The user adds 1 oz of powder to a gallon of luke warm water. Equipment is cleaned, rinsed and allowed to dry. *Mine Safety Appliances Co.*

For more data circle No. 38 on postcard, p. 101.

Four-way stapler

A new stapler is a powerful and versatile four-way stapling tool: a tacker, stapling plier, desk stapler and staple remover. Floating driver for powerful and jam-free action makes it easy to fasten at least 32 sheets of ordinary bond paper. *Bostitch, Inc.*

For more data circle No. 39 on postcard, p. 101.

METAL STAMPING FACILITIES
by Lansing
at your Service for...
TRANSPORTATION EQUIPMENT
HOUSEHOLD APPLIANCES
ELECTRICAL EQUIPMENT
INDUSTRIAL EQUIPMENT
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ALLOY TROUBLE?

If you have missed the special Iron Age series of five articles on boron steel which appeared last July and August you may want to order a reprint.

A 30-page reprint booklet covers the following:

1. *Recommended alternates for standard grades.*
2. *Advantages and limitations of boron steels.*
3. *Hardenability charts.*
4. *Case studies of boron steel use in plants making gears . . . pinions . . . springs . . . bolts . . . axles.*

A limited quantity of reprints is still available.

Price 50¢ each.

Address:
Reader Service Dept.
The Iron Age
100 E. 42nd St., New York 17, N. Y.

New Equipment

Continued

Vacuum furnaces

Complete line of vacuum furnaces for metal processing are electrically heated and built for one of three purposes: resistance heating, induction heating, or arc melting. Resistance-heated furnaces are used to process metal in a solid form at up to 1800°F temperatures. Induction-heated furnaces process metals in a molten state at temperatures to 3200°F. Arc-melting furnaces form ingots from metal sponge and powdered metal compacts at extremely high temperatures. Melting is normally done in an argon atmosphere after high vacuum has completely out-gassed the material. *F. J. Stokes Machine Co.*

For more data circle No. 40 on postcard, p. 101.

Compact machine tool

On a Hommel universal multi-purpose machine, complicated workpieces can be machined on all sides usually without changing the original setup. Many special attachments and tools are available for the Hommel, and all parts are interchangeable. With the various attachments, precision turning, facing, milling, grinding, drilling, planing, jig boring, polishing, and slotting can be performed. The base plate can be used as a tracing plate and a measuring table. Drive system can be set up for 25 different spindle speeds. *Morey Machinery Co., Inc.*

For more data circle No. 41 on postcard, p. 101.

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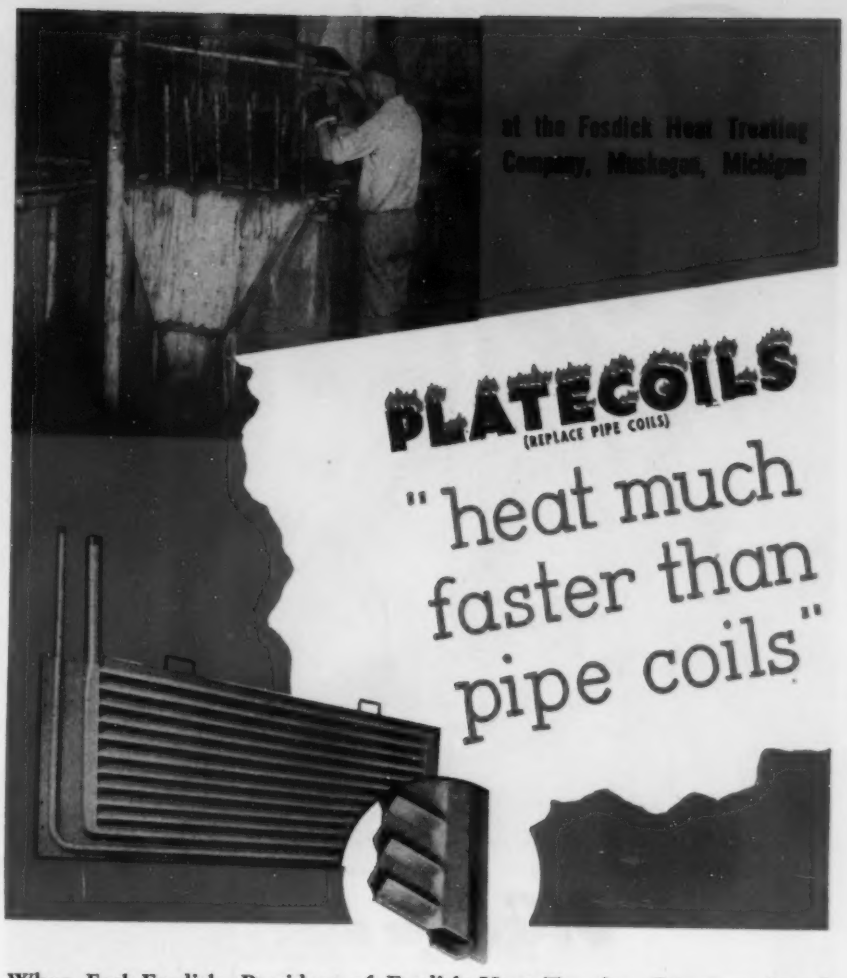
at the Fosdick Heat Treating Company, Muskegon, Michigan
PLATECOILS
(REPLACE PIPE COILS)
"heat much faster than pipe coils"

When Earl Fosdick, President of Fosdick Heat Treating Company, heard about the advantages of Platecoils, he wanted to try them in such a hurry that he flew to the Factory and picked up his first unit. This first Platecoil proved so satisfactory that he ordered a second unit SHIPPED AIR EXPRESS.

Each Platecoil heats a copper plating tank used in the heat treating of cam shafts for diesel engines. The Platecoils heat much faster than the pipe coils they replaced, so it's possible to start plating much earlier on Monday morning after the week-end shut down. In addition, the Platecoils require less space in the tanks giving them more plating capacity.

Platecoils heat faster than the pipe coils because they have more prime surface in a given area. A 22" x 47" Platecoil has the same heat transfer surface as 32 feet of 1½" pipe which occupies approximately 30" x 60" of space. This means better than 50% savings in space and material, and results in a lower initial cost.

Platecoils' faster heating coupled with their unusually low maintenance costs provide savings that are too great to be ignored. It costs nothing to see what Platecoils will do for you. *Airmail your request today for your copy of bulletin No. P73.*

PLATECOIL gives you these ADVANTAGES

- Cleaned and Repaired Without Dumping Tank Solution
- Greater BTU Transfer Per Unit Area
- Weighs Only Half as Much as Pipe Coil
- No Threaded Joints in Tank
- Increased Tank Capacity
- Fast, Easy Installation
- Easy to Clean

PLATECOIL
Division
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an
ACCO
product
featuring
DUALOC*
BIG . . . or small
• It makes no difference if your load is big or small, light or heavy, rough or smooth. There is an ACCO Registered Wire Rope Sling for the job.
You can get standard Strand-Laid and Cable-Laid Slings from local distributors. Many others are carried in factory stock. The big ones and very special ones we design and make specially for you.
Every ACCO Registered Wire Rope Sling is proof-tested, identified with a metal tag, and warranted as to rated capacity. We eliminate the guesswork. See your distributor today or write for information.
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Wire Rope
Slings

Continuous marking

Imprinting a permanent legend 3/16 in. deep x 8 in. long in a continuously repeated pattern over the entire length of bars, tubes, rods can be accomplished in one quick operation with a high-speed manual device, Rolamarker 601. Stock materials thus marked can be identified by supply clerks regardless of how many cuts have been taken from them. Rolamarker 601 is supplied as a complete ready-to-use kit, including type and ink. *Adolph Gottscho, Inc.*

For more data circle No. 42 on postcard, p. 101.

On-the-job mitering

Metalmitre is a hand tool that enables one to do on-the-job mitering of metals, with ease and precision. It produces clean, accurate cuts with a mere squeeze of the stainless steel handle. Various dies are available for burr-free mitering, notching, slotting of non-hardened steel up to 1/32 in. and metals such as copper and aluminum up to 1/16 in. Snap in feature makes dies instantly interchangeable. Tool weighs 2 lb. *Lander & Abbott.*

For more data circle No. 43 on postcard, p. 101.

Wheel dresser

Diamond wheel life is said to be extended 50 pct when dressed with a new diamond wheel dressing machine. Easily mounted on a work table and engineered to dress wheels on spindles, the new product dresses radii, periphery and angles from +0.00025 to −0.0005. New cutting edges are exposed with a minimum removal of stock. Vernier scale gives quick precise angle setting. *Eastern Tool Co.*

For more data circle No. 44 on postcard, p. 101.

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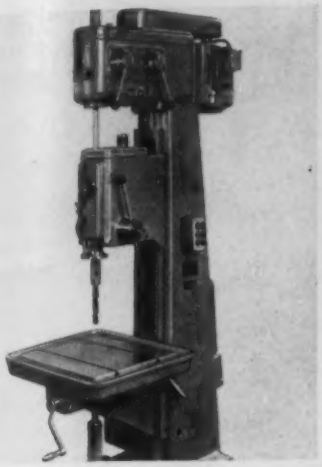


Quick change-over

New Alfing heavy-duty drill press redesigned to meet American mass-production methods has table and headstock adjustable, facilitating quick change-over from one job to another. Drilling capacity is 1 in. in steel and 1¼ in. in cast iron. Work table measures 26 x 28 in. The 9-in. spindle stroke is driven by flange-mounted or a V-belt drive 3 hp ac motor. Eight spindle speeds range from 150 to 1640 rpm in geometrical progression. *Kurt Orban Co.*

For more data circle No. 45 on postcard, p. 101.

Brazing paste

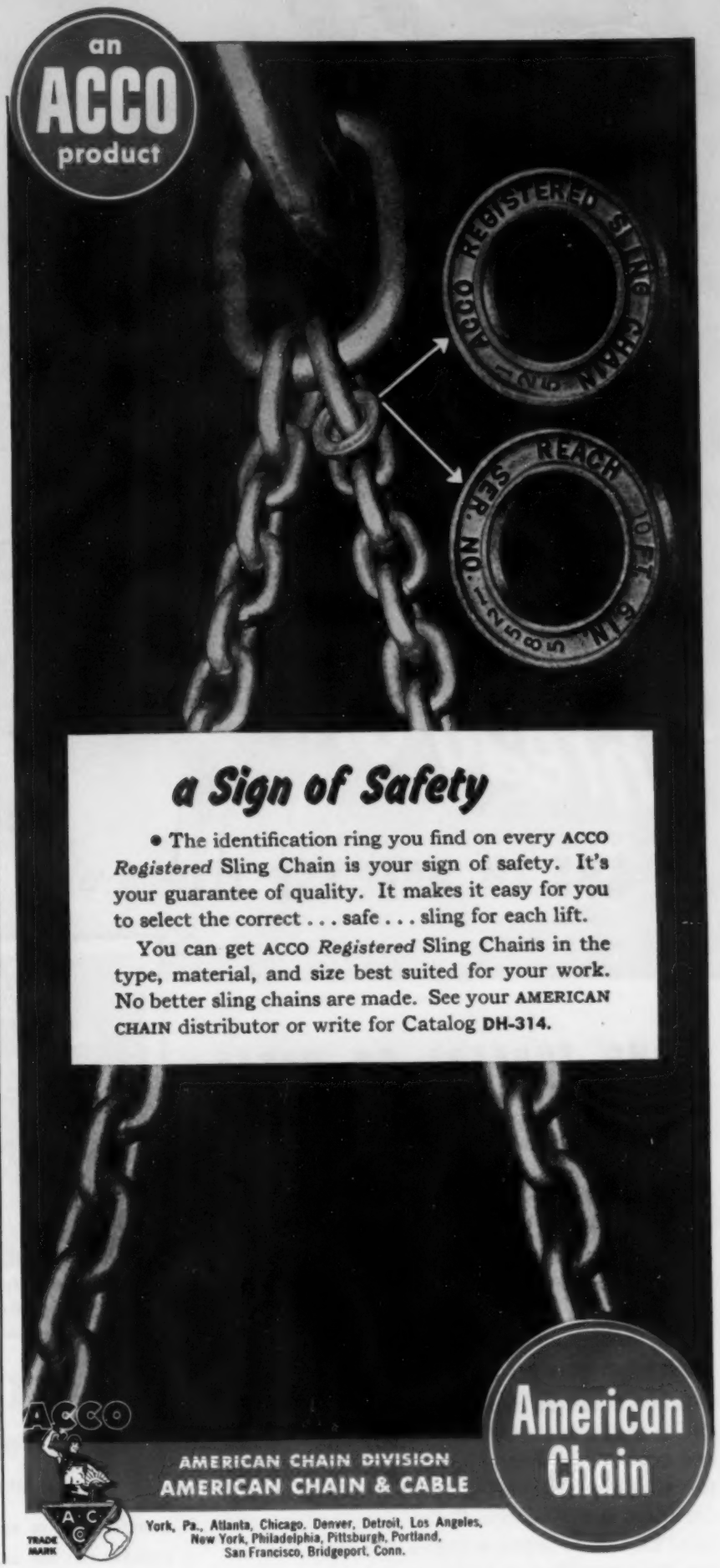
Phos-Copper paste in collapsible tube form is a free flowing brazing alloy with a low melting point for brazing operations on copper and copper alloys. An alloy of copper and phosphorus, Phos - Copper's fluidity and wetting properties provide good capillary action that enables it to penetrate tight-fitting joints instantly to form a strong, ductile bond. On most copper applications, no flux is required. *Westinghouse Electric Corp.*

For more data circle No. 46 on postcard, p. 101.

Water-repellent walls

Porous masonry becomes water repellent when treated with Hydrocide S. X Colorless. One application stops driving rains. It will not discolor walls; will not wear away. It sheds dirt and controls efflorescence. S.X. penetrates, makes the masonry itself water repellent. *L. Sonneborn Sons, Inc.*

For more data circle No. 47 on postcard, p. 101.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ACCO REGISTERED SLING CHAIN
REACH
SER. NO.
a Sign of Safety
• The identification ring you find on every ACCO Registered Sling Chain is your sign of safety. It's your guarantee of quality. It makes it easy for you to select the correct . . . safe . . . sling for each lift.
You can get ACCO Registered Sling Chains in the type, material, and size best suited for your work. No better sling chains are made. See your AMERICAN CHAIN distributor or write for Catalog DH-314.
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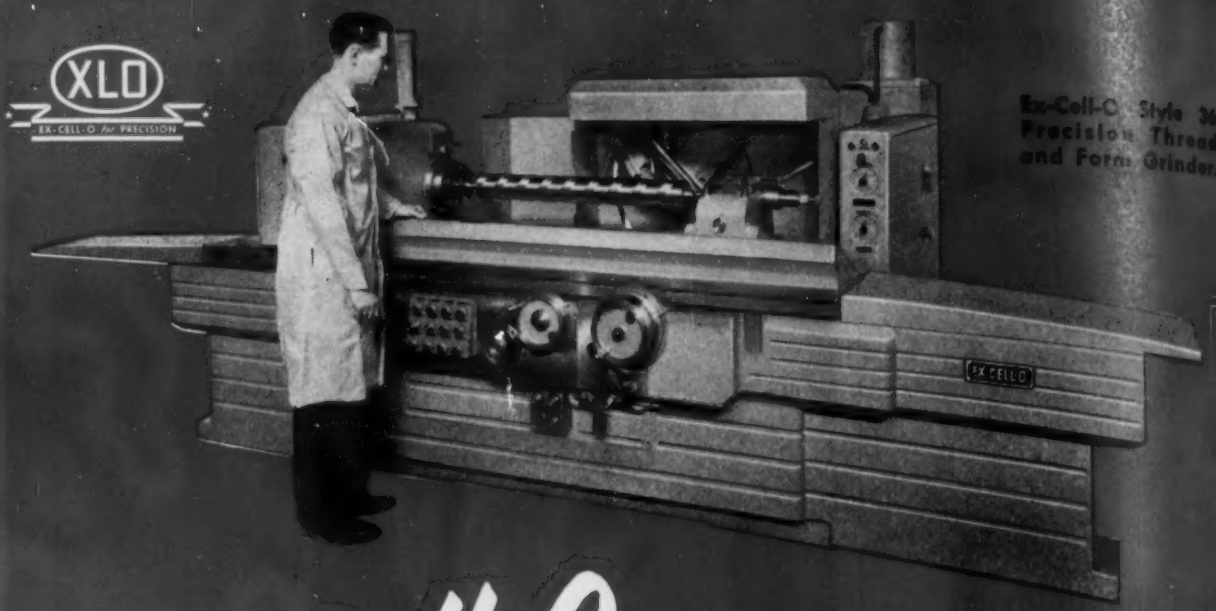
American Chain

UNIVERSITY OF MICHIGAN LIBRARIES

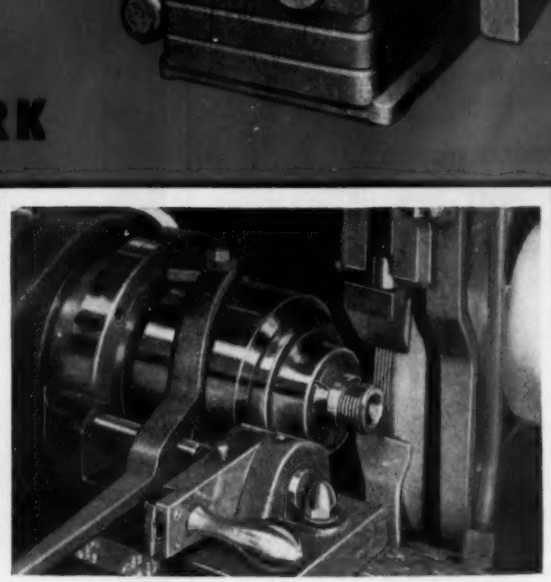


Ex-Cell-O Style 36 Precision Thread and Form Grinder.

Ex-Cell-O Thread Grinders

ARE IN DEFENSE WORK

Ex-Cell-O Style 33 Automatic Precision Thread Grinder.



Threading gun barrels on a Style 33 Thread Grinder with multiple rib wheel.

GRIND THREADS ON PARTS FOR PLANES, GUNS, ROCKETS

Ex-Cell-O Precision Thread Grinders are in the thick of the defense program. They're used for grinding threads on parts for both jet and reciprocating aircraft engines and many items of armament. For accurate threads on hardened steel parts the threads must be ground after hardening. For alloys and stainless steels that are tough, though not extremely hard, thread grinding is often more economical than other methods.

Internal, external, and universal thread grinders are included in Ex-Cell-O's complete line. If you are considering thread grinding write or phone to Ex-Cell-O in Detroit for more information and complete specifications. Better yet—call in your local Ex-Cell-O representative and show him the job. He's qualified to help you.

EX-CELL-O

CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Market Marking Time Waiting Court Decision

Steel firms fear court victory might mean quick strike . . . But feel they must win . . . Consumers don't seem worried . . . Blast furnace scrap below ceiling . . . Ingot rate gains.

In these days of "shortage" and threat of strike steel consumers are acting strangely—almost as if they weren't worried at all. By and large, they aren't pressing for quick delivery. They aren't frantically trying to place big orders. They aren't buying premium priced material. They aren't making big conversion deals. They aren't even listening to gray market offers.

On the other hand, they are becoming more particular over quality. They are carefully specifying and insisting on particular sizes and grades they want. They are buying closer to home—to save freight. And most will admit that their inventories are fair to good. In time of real shortage they wouldn't admit this—even if true.

Gaining—Despite the influence of government controls, all this has to mean the producers are gaining on their market. They know it, too. Most are looking for a definitely competitive market in the fourth quarter—perhaps in the third. However, they expect a few products such as larger sizes of bars and plates (both in strong military demand) and linepipe and oil country goods to remain in strong demand.

They admit that they are stepping up their selling effort, and watching their competitors' prices. It all points to an easier market, but a strike could change it—quickly.

Fear Strike—There's no doubt that mills are fearful of another strike. Some mills have cautioned their scrap suppliers not to make long-term commitments. In some instances performance agreements require shipment within 30 days. Steelmaking scrap is moving at a fairly rapid (very rapid in some areas) pace. Mills are refusing to pay long freight hauls.

Though steelmaking grades of scrap are still clinging to ceiling prices, blast furnace grades have joined cast scrap in selling below ceiling. A steel strike might cause steelmaking scrap to lose its price grip and tumble with the rest. But, even though the market is weaker now, the shortage may be as bad as ever next winter.

Marking Time—This week finds the steel industry at the crossroads — waiting for a Supreme Court decision that is expected to point the direction it will take. All market factors are awaiting this crucial decision. When it comes, it will probably touch off a chain of developments—either rapid-fire or simultaneous. Either way, there will be plenty of action.

This Could Happen—Here are some of the things that might happen:

(1) A decision against government seizure of the industry would probably touch off another steel strike. Phil Murray still has strong control of the union. But he has made it clear that the only thing now preventing a strike is his reluctance to permit one against the government. The United Steelworkers are in an explosive mood, and the fuze is wired to the Supreme Court decision. If there is to be another strike, labor's position will be stronger if it comes before steel becomes plentiful.

(2) A strike would kill any chance of an early lifting of controls over steel. Thus, it is possible for the industry to win its freedom from seizure, and at the same time lose its fight for freedom from controls. Both are important. But by far the gravest concern is felt over the seizure case, which the companies feel they must win. A strike—if it comes—would probably hurt them less next fall than it would now. This is because their high rates of production and expansion are expected to catch (if not surpass) demand by then.

(3) The fairly rapid trend toward balance between steel supply and demand might be shoved away from its fulcrum. This could mean another long, hard battle of production to bring them into balance again.

Court Calendar—There is still no hint as to when the decision will come. The Supreme Court met on Monday with no mention of the steel seizure case. It is scheduled to meet again next Monday (June 2) and then recess for the summer. Customarily the court announced its decisions on Mondays, but it can (and has done so) any time. If the decision isn't forthcoming by next Monday, the court could delay its summer recess to clear up this important case.

President Truman, meanwhile, is planning to seek Congressional backing for the seizure if the high court rules against it.

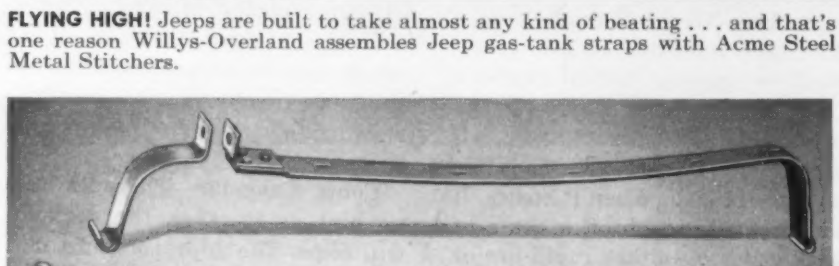
Steelmaking operations this week are scheduled at 102.5 pct of rated capacity, up 1 pct from the previous week.

UNIVERSITY OF MICHIGAN LIBRARIES

Acme Steel Stitching Insures S.A. *(Strong Assembly)*

Fastening felt-to-steel with Acme Steel Metal Stitcher saves time, money, materials, too, on Willys-Overland Jeep production

FLYING HIGH! Jeeps are built to take almost any kind of beating . . . and that's one reason Willys-Overland assembles Jeep gas-tank straps with Acme Steel Metal Stitchers.



FIVE CENTS SAVED PER STRAP—that's the saving Willys-Overland made when they switched to Acme Steel metal stitching. Here on the finished gas-tank straps, you can see the neat, strong, money-saving steel stitches.

PRODUCTION BOOSTED BY STITCHING FELT TO STEEL. This Acme Steel Metal Stitcher assembles Jeep gas-tank straps by stitching asphalt-saturated felt to 18-gage (0.0475 inch) steel strap, and it takes just 1/5 of a second per stitch—far faster than other assembly methods. It boosted production for Willys-Overland to 300 units per hour.

You might think Acme Steel metal stitching doesn't apply to your product. But if you have any assemblies of steel, brass, copper or aluminum fastened to each other or to wood, felt, cork, canvas, leather, rubber, fibre, plastic, asbestos or the like—you name it—chances are Acme Steel can help you cut costs and speed production at the same time!

Ask your Acme Steel representative, or write to Acme Steel Products Division, Dept. No. IA 52.

ACME STEEL

ACME STEEL COMPANY

2825 Archer Avenue, Chicago 8, Illinois

Market Briefs

Selling Tough—Pig iron salesmen report it is getting increasingly difficult to sell their wares. Non-integrated steel mills will still take all they can get but not the foundries. Main difficulty is the low level of foundry operations. But even the busy ones are taking less pig iron because of the great spread now between scrap and pig prices. Where quality is of little importance foundries can bring their melt ratio down to about 10 pct pig. Where machining of castings will be necessary a 30 to 40 pct pig iron charge is being used.

Steel Exports—Supplementary quota of 45,352 tons of varied carbon steel has been made available for commercial export during the current quarter by the National Production Authority. The bonus quota is comprised mostly of hot and cold rolled sheet rejects and blackplate waste wasters, but also includes 1475 tons of wire rod rejects and 857 tons of used and reject pipe. Second quarter quota for all kinds of pig iron is 2500 tons along with 130,000 lb (metal content) of bismuth salts. Quota for aluminum sheets has been pegged at 1.5 million lb; aluminum welding rods and electrodes at 55,000 lb and aluminum wire and screen cloth at 10,000 lb.

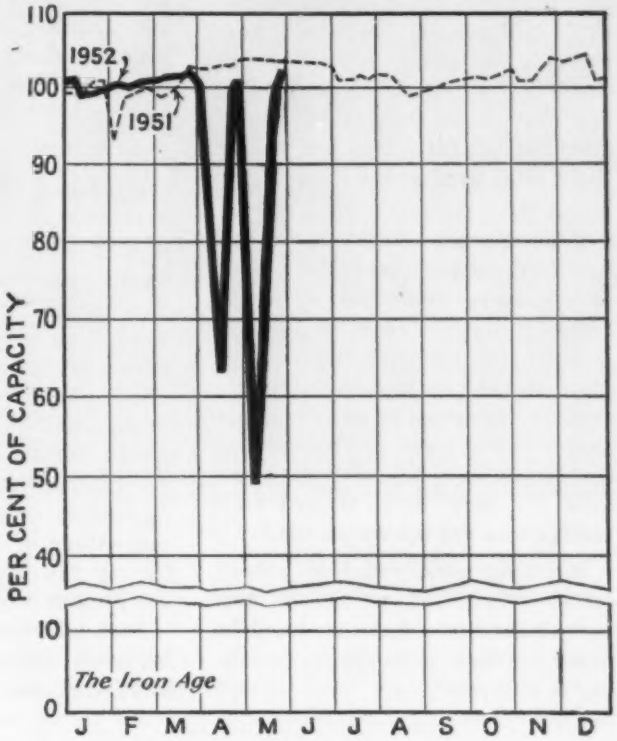
Controlled Materials—Mutual Security Agency authorized three western European nations to purchase almost $3 million worth of controlled materials and specialized equipment. Germany will receive $1.5 million worth of nonferrous ores and concentrates from Latin America and $210,000 in steel mill products from the U. S. Greece will be the recipient of $300,000 worth of steel mill products and $200,000 in copper and zinc products, all from the U. S. The U. S. will also send $300,000 worth of special oil drilling and refining equipment to French North Africa. Another recent approval, to be purchased by bid, was for 19 diesel engines for crane operation at Piraeus Port, Greece.

Ore Consumption—Total iron ore consumption by furnaces in the U. S. and Canada dropped to 6,616,196 tons for the month of April. U. S. consumption was 6,291,121 tons, more than one million tons less than the March rate. Cumulative consumption for the two countries during the January-April period was 29,394,868 tons, or about one million tons more than during the comparable period last year. Stocks of iron ore on hand in the U. S. and Canada totaled 19,591,854 tons, an increase of 4½ million over last year.

No Mill Yet—Reports that New Orleans may be the site of a $75 million integrated steel mill are premature. Discussions have so far indicated only that Barium Steel Corp. would be interested in building a 650,000-ton-a-year plant in the Gulf Coast area to make plate and oil country goods. The matter of financing is still unsolved and depends primarily on the extent of local interest in the project.

Recovery—After 2 weeks, business in the Pittsburgh district recovered from effects of the brief steel strike. University of Pittsburgh reports its adjusted index of business rose to 187.6 pct of the 1935-39 average, substantially the same as in the week ended Apr. 26.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
May 18	102.5*	105.0*	102.0*	101.0	105.0*	104.0	101.0	110.0	97.0	102.0	94.5	87.0	98.0*	101.5
May 25	102.0	105.0	102.0	101.0	106.0	104.0	100.5	110.0	98.0	102.0	91.0	95.5	90.5	102.5

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.
* Revised.

Eliminate Copper Import Ceiling

Users can now pay what they must, can pass on 80 pct of increased cost . . . See possible increase in allotments . . . NPA faced with tough allocation problem—*By R. L. Hatschek.*

Last week saw government policy on procurement of foreign copper take a more realistic turn (see p. 42). In a nutshell, copper consumers are now permitted to buy all the foreign copper they can get, up to International Materials Conference limits, paying whatever they have to. They are then allowed to pass on 80 pct of the increase in cost over 27½¢ per lb of copper.

In view of the Chilean action in cutting off the red metal at 27½¢, this isn't too bad a deal from the U. S. viewpoint. Chile will now market its metal at the going world price. Right now this is fine for them since they would have settled for 33½¢ per lb for their total production.

Price Future—But many members of the copper trade anticipate a continuing reduction in world prices. About 6 months ago the world price for copper was at a high of 54¢ per lb and it has already plummetted some 16¢. Some people were even of the opinion that the 27½¢ price could not have held for very long, though this feeling was not too widespread.

It is also believed that speculators may start unloading any copper they may have on hand in order to cash in while the cashing is still good.

Tough Assignment — Probably the stiffest problem facing anyone is the job of allocating copper supplies under this new setup. National Production Authority's copper division scheduled meetings for Tuesday and Wednesday in an attempt to iron out the difficulties. NPA may allocate copper on a price basis, say 70 pct domestic and 30 pct foreign, or it may continue the present policy of letting buyers get it wherever they can.

Office of Price Stabilization also has a rugged task in setting up new ceiling prices for copper and brass products. A new list is already being figured and the effective date will probably be as early as possible.

Consumer View — Manufacturers will only be permitted to pass on 80 pct of the new cost increases while absorbing the other 20 pct. This means that some will be hurt more than others. The criterion here, disregarding the source of metal which will vary from firm to firm, will be the amount of copper in the manufacturer's product. Producers of consumer durables containing only a relatively small percentage of copper will be glad to pay the premium in order to get greater supplies.

Best example is the automotive industry. Each car contains about 50 lb of copper and even a 20¢ per lb hike would only increase a car's cost by $10. Yet this extra $10 might mean a trouble-free radiator and better chrome-plated brightwork. It might even lead to savings in research now devoted to finding substitute materials. This same reasoning applies to several other industries in varying degrees.

Allocations—Under IMC allocations the U. S. is permitted approximately 130,000 tons of copper per month for the third quarter. With domestic production of refined copper hitting about 95,000 tons a month and assuming about 3000 tons exported, nearly 40,000 tons of foreign copper may be imported per month. Comparing with the possible 130,000 tons, 104,899 tons were allocated to fabricators for June.

Another Cut—Antimony prices were again reduced by National Lead Co. last week. This cut was 5¢ per lb, bringing the price down to 39¢ f.o.b. Laredo, Tex. The earlier cut was 6¢. The latest reduction was a result of continuing keen competition from foreign sources as well as an easing in ore prices.

Zinc, Lead Activity—Lead consumers continued to make much heavier purchases than they did before the series of price dips. This tends to confirm the stability of the market at the current 15¢ per lb. But some members of industry feel an even lower price is in the offing. Business for future delivery is all being transacted on an average price basis.

All contracts for future delivery on zinc are likewise being written with an average price clause but the metal is still holding at the current 19½¢ price. Many people feel that June will see a downward revision is zinc prices. While Prime Western grade is still in good demand, the higher grades are not moving to the satisfaction of producers.

NONFERROUS METAL PRICES

	May 21	May 22	May 23	May 24	May 26	May 27
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	....	$1.215	$1.215
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices.

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You Always Know Where You Are . . . with BRASS

You can always chart a true course in production and marketing, when you work with Brass. For its "working behavior" on any job is well-known, always reliable, never erratic. Yes, Brass is easy to get along with, whether you're fabricator or user. And you'll never be left high and dry . . . like a major manufacturer who was forced to try a substitute material during the recent copper "shortage" . . . and who wound up paying more than $10,000,000 in free replacement parts to angry customers.

No, it shouldn't be long before there's a *shortage of shortages*. And so, in the words of the world's largest copper producer (a producer of many other metals as well): "On the basis of the facts, there is no need to consider long-range substitution of other materials for the red metal." For, when all is said and done, *there are* no *substitutes for Brass*. And if you are a user of Brass mill products, your inquiries are invited *now*.

• • •

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.6¢ to 38.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5 to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-ST-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. **Coiled Sheet:** 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅞ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepair on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	39.00
Berryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.50
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.25
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium dollars per troy oz.	$200
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$198 to $201
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	84.00
Tin, New York	$1.215
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.33
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33⅜
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.40
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21⅛	20¾
Yellow brass	19⅛	17¾
Red brass	20⅛	18¾
Comm. bronze	20⅛	19¾
Mang. bronze	18⅞	17¾
Brass rod ends	18⅝	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¼—17¾
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14⅝
No. 1 composition	18 —18½
No. 1 composition turnings	17⅜—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½
Aluminum	
Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	7½— 8
Zinc	
New Zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7
Nickel and Monel	
Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13
Lead	
Soft scrap, lead	11 —11¼
Battery plates (dry)	6¼— 7
Batteries, acid free	5
Magnesium	
Segregated solids	15 —16
Castings	14 —15
Miscellaneous	
Block tin	100 —110
No. 1 pewter	80
No. 1 auto babbitt	60
Mixed common babbitt	13½—14
Solder joints	19 —20
Siphon tops	60
Small foundry type	15½
Monotype	15 —15½
Lino. and stereotype	14 —14½
Electrotype	12 —12½
Hand picked type shells	13 —13½
Lino. and stereo. dross	6 — 6½
Electro. dross	4 — 5

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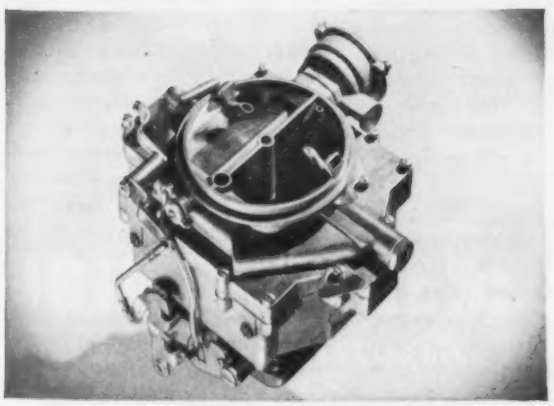
The Defense Production Administration's latest List of Basic Materials and Alternates shows
SPECIAL HIGH GRADE ZINC
Moved to Group III
This means that this grade of Zinc—used for die casting —is in good supply and, by D.P.A. definition, should be used as an alternate for scarcer materials.

NO REASONABLE SUBSTITUTE FOR ZINC DIE CASTINGS

These ZINC Die Castings are the principal assembly components of the new four-jet automobile carburetor pictured below. By no other means of manufacture can such amazingly complex parts be produced at anything approaching comparable cost. After simple trimming operations, only the tapping of cored holes and the drilling of additional holes at odd angles are required to prepare these parts for assembly. Die casting is, truly, the shortest distance between raw material and finished part.



This four-jet carburetor is really two carburetors in one. The primary unit alone is in use until unusual acceleration is called for (as when passing a moving car), then the second unit comes into play.

While a carburetor bowl may be an extreme example of castability, it is an established fact that the physical and economic advantages of ZINC Die Castings are such that other materials and manufacturing methods seldom can be substituted. *With ample supplies of Special High Grade zinc assured, and with die casting equipment readily available, product engineers should continue to take advantage of the economies of ZINC Die Castings.*

If you are not now using ZINC Die Castings in your products, you may be overlooking a practical means of materially lowering your costs. Consult with any commercial die caster—or write to us. Ask for a copy of "Designing for Die Casting."

The New Jersey Zinc Company, 160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

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HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Strike Chance Quickens Scrap Supply

Mill stockpiles get bigger . . . Some scrap men ship all they can to beat strike . . . Yet some buyers are cautious . . . Blast furnace scrap grades slip below ceiling in new centers.

While consumer scrap stockpiles add more heft, the scrap and steel industries are drawing nearer to the tape on the strike issue. There is a strong tendency shown by many scrap shippers to get out all the scrap possible before a strike can occur. On the other hand scrap purchasers are developing a cautious buying policy.

Steelmaking grades are going to mills at a fast trot. Mills will accept good quality material without a murmur but the push has gone out of their procurement in many cases. They merely accept and inspect. Brokers are getting instructions from buyers to shorten their buying position. The stress is on 30-day contracts.

Blast furnace grades slipped under OPS ceiling price level in Chicago and the same thing happened in Detroit. This follows the recent fall of ceiling limits on blast furnace grades in Cleveland.

Pittsburgh reports a flood of incoming scrap. Because of this some mills have been forced to postpone shipments. Stockpiles in this scrap-minus area range up to 40 days. When the shortage was in force some scrap departments surrendered storage space to other plant departments. Now they must have it back.

Pittsburgh — This area is being flooded with scrap. Some mills have been forced to hold up shipments. Storage space is becoming a problem. One consumer is struggling to get back stocking areas taken over by other mill departments when scrap inventories were so skimpy they required little space. Inventories range up to 40 days and are approaching the point where purchases might be curtailed.

Chicago — Although openhearth grades were going well and electric furnace was still selling, Chicago scrap men were not optimistic about the scrap outlook for the next 30 days. Mills still seem to be well supplied and not over-eager for scrap. Foundries are not purchasing any large amounts. Stove plate purchased on an experimental basis sold for $44 a ton delivered Chicago. Turnings have taken a turn for the worse, slipping below price ceilings. Springboards allowed by mills were negligible.

Philadelphia—The trade here anticipates no softening in steelmaking scrap prices at least until July. They aren't saying what will happen then. Mills in this district are running with an estimated 3- to 4-week scrap cushion at present. About 75 pct of the auto wreckers here have stopped cutting scrap and motor blocks are still a drug. Result is that most dealers are now stripping blocks in the hope of picking up the $11 difference in price.

New York—Demand for steelmaking grades of scrap continued strong. Supply of No. 2 grades seems to have tapered off slightly but demand nevertheless remains unchanging. Blast furnace grades still cling to ceiling levels despite unfavorable reports from outside districts. The trade is worrying about the Supreme Court decision. If it causes a strike, scrap shipments will dwindle.

Detroit — Below-ceiling prices on blast furnace grades were reported here last week. Yet few sales are being made at the moment. Buyers are backing away from turnings at ceiling. Two auto plants will receive bids this week on scrap listings. Below ceiling prices are expected on bidding for the scrap. Openhearth scrap is being readily accepted at ceiling. Cast scrap is off below ceiling.

Cleveland—Scrap was quiet last week as sources in the trade were awaiting the Supreme Court's action on the steel seizure to see what direction the market would take. Some sources believe that prices will hit the skids if another steel walkout takes place. Meanwhile mills are cautioning suppliers not to get in a long position and to buy cautiously. Mills are taking in scrap steadily but are not pushing for it. Shipments are being restricted and springboards limited to around $4.

St. Louis — Shippers are getting their scrap iron to market as fast as they can because of: (1) Fears of an unfavorable court decision which could bring on a steel strike, and (2) the belief that prices cannot go higher but could go lower. Mill buying plans are cautious for the same reasons. They are building up their inventories, with a 60-day supply as their goal.

Birmingham—Dealers are becoming alarmed by the drop in orders, and the care with which shipments are inspected by mills. Most dealers have enough orders on hand to finish the month, but are dubious about conditions after that. The cast market continues at a standstill. With pig iron plentiful at $43 a ton the foundries refuse to buy cast at $42 and dealers seem just as determined not to shave prices any more, despite huge inventories.

Cincinnati—Scrap is rolling to the mills in the area in good volume with mill inventories building up to fair levels. Current stocks are from 15 to 18 days. Some weakness in borings and turnings has been indicated but there is little evidence of these grades going under ceilings at present. Mills are eager for local scrap but are not pushing for it at any great distance. No. 2 bundles are in good supply. Offerings of a substantial tonnage of No. 2 bundles from the Southwest have been made to local consumers with no takers because of the long freight.

Boston—The slowup in demand has caught up with No. 2 grades of steelmaking scrap. Situation is not yet viewed as serious and no below-ceiling sales have been reported. Supply seems to be strong.

Buffalo—While steelmaking grades continue to hold at ceiling levels further weakness was reported in cast grades. Prices on cast scrap were off $8-$9 from control levels. Easier tendencies dominated entire market. In addition to softer tone locally, the first receipts from the Seaboard via the canal were reported.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →		$0.69	.75	.53	.65	.75	.51	.75	.51	.75	.70	.76	.83	.65	.28	1.34	.78	.50	.20	.51	.20	.62	.47	.51	.51	.51	.51	.75	.83	.75	.70	.80	.43	.51	.33	.67	$3.22 $3.22 $3.22 $3.22 $3.22 $3.22
Basing Points →		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Weirton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles, Pittsburg, Cal., Portland, San Francisco, Seattle
GRADES	OPS No.																																				
No. 1 bundles	1	$44.00		$44.00		$43.00		$42.50		$42.00		$41.00	$41.15	$40.00	$39.50	$39.00	$38.00	$37.00	$36.00
No. 1 busheling	2	44.00		44.00		43.00		42.50		42.00		41.00	41.15	40.00	39.50	39.00	38.00	37.00	35.00
No. 1 heavy melting	3	43.00		43.00		42.00		41.50		41.00		40.00	40.15	39.00	38.50	38.00	37.00	36.00	34.00
No. 2 heavy melting	4	43.00		43.00		42.00		41.50		41.00		40.00	40.15	39.00	38.50	38.00	37.00	36.00	34.00
No. 2 bundles	5	43.00		43.00		42.00		41.50		41.00		40.00	40.15	39.00	38.50	38.00	37.00	36.00	34.00
Machine shop turnings	6	34.00		34.00		33.00		32.50		32.00		31.00	31.15	30.00	29.50	29.00	28.00	27.00	25.00
Mixed borings and turnings	7	36.00		36.00		37.00		36.50		36.00		35.00	35.15	34.00	33.50	33.00	32.00	31.00	29.00
Shoveling turnings	8	36.00		36.00		37.00		36.50		36.00		35.00	35.15	34.00	33.50	33.00	32.00	31.00	29.00
Cast iron borings	10	38.00		38.00		37.00		36.50		36.00		35.00	35.15	34.00	33.50	33.00	32.00	31.00	29.00
No. 1 chemical borings	26	41.00		41.00		40.00		39.50		39.00		38.00	38.15	37.00	36.50	36.00	35.00	34.00	32.00
Forge crops	11	51.50		51.50		50.50		50.00		49.50		48.50	48.65	47.50	47.00	46.50	45.50	44.50	42.00
Bar crops and plate	12	49.00		49.00		48.00		47.50		47.00		46.00	46.15	45.00	44.50	44.00	43.00	42.00	40.00
Punchings and plate	14	46.50		46.50		45.50		45.00		44.50		43.50	43.65	42.50	42.00	41.50	40.50	39.50	37.50
Electric furnace bundles	15	46.00		46.00		45.00		44.50		44.00		43.00	43.15	42.00	41.50	41.00	40.00	39.00	37.00
Cut struct., plate, 3 ft and less	16	47.00		47.00		46.00		45.50		45.00		44.00	44.15	43.00	42.50	42.00	41.00	40.00	38.00
Cut struct., plate, 2 ft and less	17	49.00		49.00		48.00		47.50		47.00		46.00	46.15	45.00	44.50	44.00	43.00	42.00	40.00
Cut struct., 1 ft and less	18	50.00		50.00		49.00		48.50		48.00		47.00	47.15	46.00	45.50	45.00	44.00	43.00	41.00
Foundry steel, 2 ft and less	20	44.00		44.00		43.00		42.50		42.00		41.00	41.15	40.00	39.50	39.00	38.00	37.00	35.00
Foundry steel, 1 ft and less	21	46.00		46.00		45.00		44.50		44.00		43.00	43.15	42.00	41.50	41.00	40.00	39.00	37.00
Heavy trimmings	24	43.00		43.00		42.00		41.50		41.00		40.00	40.15	39.00	38.50	38.00	37.00	36.00	34.00
No. 1 RR heavy melting	RR 1	46.00		46.00		45.00		44.50		44.00		43.00	43.15	42.00	41.50	41.00	40.00	39.00	37.00
Scrap rails, random lengths	RR 14	48.00		48.00		47.00		46.50		46.00		45.00	45.15	44.00	43.50	43.00	42.00	41.00	39.00
Scrap rails, 3 ft and less	RR 16	51.00		51.00		50.00		49.50		49.00		48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Scrap rails, 2 ft and less	RR 17	52.00		52.00		51.00		50.50		50.00		49.00	49.15	48.00	47.50	47.00	46.00	45.00	43.00
Scrap rails, 18 in. and less	RR 18	54.00		54.00		53.00		52.50		52.00		51.00	51.15	50.00	49.50	49.00	48.00	47.00	45.00
Rerolling rails	RR 15	53.00		53.00		52.00		51.50		51.00		50.00	50.15	49.00	48.50	48.00	47.00	46.00	44.00
Uncut tires	RR 20	48.00		48.00		47.00		46.50		46.00		45.00	45.15	44.00	43.50	43.00	42.00	41.00	39.00
Cut tires	RR 21	51.00		51.00		50.00		49.50		49.00		48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Cut bolsters and side frames	RR 23	49.00		49.00		48.00		47.50		47.00		46.00	46.15	45.00	44.50	44.00	43.00	42.00	40.00
RR specialties	RR 24, 28, 29	51.00		51.00		50.00		49.50		49.00		48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Solid steel axles	RR 25	58.00		58.00		57.00		56.50		56.00		55.00	55.15	54.00	53.50	53.00	52.00	51.00	49.00
No. 3 steel wheels	RR 27	51.00		51.00		50.00		49.50		49.00		48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Unassorted	RR 35	40.00		40.00		39.00		38.50		38.00		37.00	37.15	36.00	35.50	35.00	34.00	33.00	31.00

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pct of corresponding grade.

Below-Ceiling Prices

PITTSBURGH (Delivered)

Drop broken mach'y cast	$52.50 to $53.00
Cupola cast	45.00 to 46.00
Charging box cast	47.00
Heavy breakable	45.50 to 46.00

CHICAGO (Delivered)

Cupola cast	$43.00 to $44.00
Stove plate	36.00 to 38.00
Heavy breakable	38.00 to 39.50
Drop broken machinery	44.00 to 46.00
Unstripped motor blocks	34.00 to 36.00
Charging box cast	41.50 to 42.50
Clean auto cast	44.50 to 46.00
Malleable	52.00 to 53.00
Machine shop turnings	30.50
Mixed borings, turnings	34.00 to 35.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	34.00 to 35.00

PHILADELPHIA (Delivered)

Cupola cast	$40.00 to $41.00
Heavy breakable	42.00 to 43.00
Clean auto cast	45.00 to 46.00
Unstripped motor blocks	34.00 to 35.00
Charging box cast	40.00 to 41.00

CLEVELAND (Delivered)

Mixed borings, turnings	$35.00 to $36.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	35.00 to 36.00
Unstripped motor blocks	38.00 to 39.00
Cupola cast	45.00 to 46.00
Heavy breakable	39.00 to 40.00
Drop broken machinery	51.00 to 52.00

BIRMINGHAM (Delivered)

Cupola cast	$41.00 to $42.00
Stove plate	39.00 to 40.00
Charging box cast	39.00 to 40.00
Heavy breakable	36.00 to 37.00
Drop broken machinery	42.00 to 43.00
Unstripped motor blocks	35.00 to 36.00

ST. LOUIS (Delivered)

Heavy breakable	$45.00
Stove plate	42.00

NEW YORK (Brokers' buying prices)

Drop broken machinery	$36.00 to $38.00
Mixed yard cast	36.00
Charging box cast	36.00 to 38.00
Heavy breakable	36.00
Unstripped motor blocks	30.00 to 31.00

BOSTON (Brokers' buying prices)

Cupola cast	$33.00
Stove plate	33.00
Unstripped motor blocks	30.00
Heavy breakable	33.00

DETROIT (Brokers' buying prices)

Cupola cast	$46.00
Charging box	45.00
Heavy breakable	43.00
Cast iron brake shoes	39.00
Stove plate	44.00
Unstripped motor blocks	40.00
Drop broken machinery cast	50.00
Machine shop turnings	25.00 to 28.00
Mixed boring and turnings	29.00 to 32.00
Shoveling turnings	29.00 to 32.00
Cast iron borings	29.00 to 32.00

CINCINNATI (Delivered)

Unstripped motor blocks	$40.00
Stove plate	45.00
Clean auto cast	47.00

BUFFALO (F.o.b. shipping point)

Cupola cast	$40.00 to $41.00
Drop broken mach'y cast	42.00 to 43.00

SAN FRANCISCO (Delivered)

Cupola cast	$42.00
No. 2 bundles	29.00

LOS ANGELES (Delivered)

Cupola cast	$46.00
No. 2 bundles	29.00

SEATTLE (Delivered)

Cupola cast	$36.50
Heavy breakable	32.00
No. 2 bundles	29.00

SHIPPING POINT PRICES (Except RR scrap) —for shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is $1.25 per gross ton except: Memphis, 90¢; Great Lakes ports, $1.50¢, and New England ports, $1.75. Maximum shipping point price on No. 1 bundles (prime grade) in New York City is $36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	$3.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	3.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate; 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel, 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, rerolling	33.00
Bushelings	28.00
Bushelings, prepared new factory	33.00
Bushelings, unprepared new factory	32.00
Short steel turnings	32.00
Mixed borings, turnings	32.00
Cast scrap	50.00

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Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Flat-Rolled Steel: (cents per pound)	May 27, 1952	May 20, 1952	Apr. 29, 1952	May 29, 1951
Hot-rolled sheets	3.60	3.60	3.60	3.60
Cold-rolled sheets	4.35	4.35	4.35	4.35
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.80
Hot-rolled strip	3.50	3.50	3.50	3.50
Cold-rolled strip	4.75	4.75	4.75	4.75
Plate	3.70	3.70	3.70	3.70
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	36.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes	$8.70	$8.70	$8.70	$8.70
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	7.40
Special coated mfg. ternes	7.50	7.50	7.50	7.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.70
Cold finished bars	4.55	4.55	4.55	4.55
Alloy bars	4.30	4.30	4.30	4.30
Structural shapes	3.65	3.65	3.65	3.65
Stainless bars (No. 302)	31.50	31.50	31.50	31.25
Wrought iron bars	9.50	9.50	9.50	9.50
Wire (cents per pound)				
Bright wire	4.85	4.85	4.85	4.85
Rails (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.60
Light rails	4.00	4.00	4.00	4.00
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$56.00
Slabs, rerolling	56.00	56.00	56.00	56.00
Forging billets	66.00	66.00	66.00	66.00
Alloy blooms, billets, slabs	70.00	70.00	10.00	70.00
Wire Rod and Skelp: (cents per pound				
Wire rods	4.10	4.10	4.10	4.10
Skelp	3.35	3.35	3.35	3.35

Pig Iron: (per gross ton)	May 27, 1952	May 20, 1952	Apr. 29, 1952	May 29, 1951
Foundry, del'd Phila.	$58.19	$58.19	$57.97	$57.77
Foundry, Valley	52.50	52.50	52.50	52.50
Foundry, Southern, Cin'ti	55.58	55.58	55.58	55.58
Foundry, Birmingham	48.88	48.88	48.88	48.88
Foundry, Chicago†	52.50	52.50	52.50	52.50
Basic, del'd Philadelphia	57.27	57.27	57.09	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago†	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	186.25	186.25	186.25	186.25

†The switching charges for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy pages.

Scrap: (per gross ton)	May 27, 1952	May 20, 1952	Apr. 29, 1952	May 29, 1951
No. 1 steel, Pittsburgh	$43.00*	$43.00*	$43.00*	$44.00*
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	42.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	42.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Young'n	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	45.50‡	45.50‡	45.50‡	49.00†
No. 1 cast, Philadelphia	*40.50*‡	41.50‡	45.50‡	49.00†
No. 1 cast, Chicago	43.50‡	43.50‡	44.00‡	49.00†

* Basing Pt. † Shipping Pt.
Not including broker's fee after Feb. 7, 1951.
‡ Del'd., includes broker's fee.

Coke: Connellsville: (per net ton at oven)	May 27, 1952	May 20, 1952	Apr. 29, 1952	May 29, 1951
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75

Nonferrous Metals: (cents per pound to large buyers)	May 27, 1952	May 20, 1952	Apr. 29, 1952	May 29, 1951
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	$1.39
Zinc, East St. Louis	19.50	19.50	19.50	17.50
Lead, St. Louis	14.80	14.80	17.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	53.55
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	*39.00*	44.00	44.00	42.00

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.

Finished Steel Base Price

May 27, 1952	4.131¢ per lb.
One week ago	4.131¢ per lb.
One month ago	4.131¢ per lb.
One year ago	4.131¢ per lb.

	High	Low
1952	4.131¢ Jan. 1	4.131¢ Jan. 1
1951	4.131¢ Jan. 2	4.131¢ Jan. 2
1950	4.131¢ Dec. 1	3.837¢ Jan. 3
1949	3.837¢ Dec. 27	3.705¢ May 3
1948	3.721¢ July 27	3.193¢ Jan. 1
1947	3.193¢ July 29	2.848¢ Jan. 1
1946	2.848¢ Dec. 31	2.464¢ Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1
1944	2.396¢	2.396¢
1943	2.396¢	2.396¢
1942	2.396¢	2.396¢
1941	2.396¢	2.396¢
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939	2.35367¢ Jan. 3	2.27207¢ May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1929	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron

May 27, 1952	$52.77 per gross ton
One week ago	52.77 per gross ton
One month ago	52.72 per gross ton
One year ago	52.69 per gross ton

	High	Low
1952	$52.77 May 2	$52.72 Jan. 1
1951	52.72 Oct. 9	52.69 Jan. 2
1950	52.69 Dec. 12	45.88 Jan. 3
1949	46.87 Jan. 18	45.88 Sept. 6
1948	46.91 Oct. 12	39.58 Jan. 6
1947	37.98 Dec. 30	30.14 Jan. 7
1946	30.14 Dec. 10	25.37 Jan. 1
1945	25.37 Oct. 23	23.61 Jan. 2
1944	$23.61	$23.61
1943	23.61	23.61
1942	23.61	23.61
1941	$23.61 Mar. 20	$23.45 Jan. 2
1940	23.45 Dec. 23	22.61 Jan. 2
1939	22.61 Sept. 19	20.61 Sept. 12
1938	23.25 June 21	19.61 July 6
1937	32.25 Mar. 9	20.25 Feb. 16
1936	19.74 Nov. 24	18.73 Aug. 11
1929	1871 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

May 27, 1952	$42.00 per gross ton
One week ago	42.00 per gross ton
One month ago	42.00 per gross ton
One year ago	43.00 per gross ton

	High	Low
1952	$42.00 Jan. 1	$42.00 Jan. 1
1951	47.75 Jan. 30	42.00 Oct. 23
1950	45.13 Dec. 19	26.25 Jan. 3
1949	43.00 Jan. 4	19.33 June 28
1948	43.16 July 27	39.75 Mar. 9
1947	42.58 Oct. 28	29.50 May 20
1946	31.17 Dec. 24	19.17 Jan. 1
1945	19.17 Jan. 2	18.92 May 22
1944	19.17 Jan. 11	15.76 Oct. 24
1943	$19.17	$19.17
1942	19.17	19.17
1941	$22.00 Jan. 7	18.92 May 22
1940	21.83 Dec. 30	16.04 Apr. 9
1939	22.50 Oct. 3	14.08 May 16
1938	15.00 Nov. 22	11.00 June 7
1937	21.92 Mar. 30	12.67 June 9
1936	17.75 Dec. 21	12.67 June 8
1929	17.58 Jan. 29	14.08 Dec. 9

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PILING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Steel Sheet	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$70.00 *B3*			3.70 *B3*	5.50 *B3*				
	Buffalo, N. Y.			$56.00 *B3*	$66.00 *B3, R3*	$70.00 *B3, R3*		4.45 *B3*	3.70 *B3*	5.50 *B3*	3.50 *B3, R3*	4.65 *B3*	4.95 *B3*	6.40 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$73.00 *A2*	$77.00 *A2*					3.90 *A2*		5.55 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$56.00 *B3*	$66.00 *B3*	$70.00 *B3*			3.70 *B3*	5.50 *B3*	3.50 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.15 *A5* 5.85 *D1*		
	Phoenixville, Pa.								5.90 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.50 *B3*	4.65 *B3*	4.95 *A5, B3*	6.40 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.00 *R4*		
MIDDLE WEST	Alton, Ill.										3.95 *L1*			
	Ashland, Ky.										3.50 *A7*			
	Canton-Massillon				$66.00 *R3*	$70.00 *R3* $66.00 *T5*								
	Chicago, Ill.			$56.00 *U1*	$66.00 *U1, R3,W8*	$70.00 *U1, R3,W8*		4.45 *U1*	3.65 *U1, W8*	5.50 *U1*	3.50 *A1, W8*	4.90 *A1, I3*		
	Cleveland, Ohio				$66.00 *R3*							4.65 *A5,J3*		6.55 *A5* 6.70 *J3*
	Detroit, Mich.		$54.00 *R5*		$69.00 *R5*	$73.00 *R5*					4.40 *M2* 3.80 *G3*	4.85 *G3* 5.45 *M2* 5.60 *R5,D1*	5.95 *G3*	
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$56.00 *U1*	$66.00 *U1*	$70.00 *U1, Y1*		4.45 *I3*	3.65 *U1, I3*	5.50 *U1, I3* 6.00 *Y1*	3.50 *U1, Y1,I3*	4.90 *I3*	5.30 *U1, I3* 5.80 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											4.65 *A7*		
	Niles, Ohio Sharon, Pa.										4.00 *S1*	5.35 *S1*	5.60 *S1*	6.55 *S1*
	Pittsburgh, Pa.	$52.00 *U1*	$54.00 *U1, C11*	$56.00 *U1*	$66.00 *U1*	$70.00 *U1, C11*	3.35 *U1* 3.45 *J3*	4.45 *U1*	3.65 *U1, J3*	5.50 *U1, J3*	4.00 *S9,S7* 3.75 *A3* 3.50 *J3,A7*	4.65 *J3,A7* 5.00 *A3* 5.35 *B4,S7*		
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								3.90 *W3*		3.60 *W3*	4.65 *W3* 4.65 *F3*	5.75 *W3*	7.20 *W3*
	Youngstown, Ohio					$70.00 *Y1, C10*	3.35 *U1, R3*			6.00 *Y1*	3.50 *U1, R3, Y1*	4.65 *R3, Y1* 5.25 *C5,T4* 5.35 *B4*	5.30 *U1, R3* 5.80 *Y1*	6.55 *R3* 7.05 *Y1*
WEST	Fontana, Cal.	$79.00 *K1*	$80.00 *K1*	$75.00 *K1*	$85.00 *K1*	$89.00 *K1*			4.25 *K1*	6.10 *K1*	4.75 *K1*	6.30 *K1*	6.20 *K1*	6.95 *K1*
	Geneva, Utah				$66.00 *C7*				3.65 *C7*	5.50 *C7*				
	Kansas City, Mo.								4.25 *S2*		4.10 *S2*			
	Los Angeles, Calif.				$85.00 *B2*	$90.00 *B2*			4.25 *B2, C7*	6.05 *B2*	4.25 *B2,C7*	6.40 *C1*	6.05 *B2*	
	Minnequa, Colo.								4.10 *C6*		4.55 *C6*			
	San Francisco, Cal.				$85.00 *B2*				4.20 *B2*	6.00 *B2*	4.25 *C7,B2*		6.05 *B2*	
	Seattle, Wash.	$73.00 *S11*			$85.00 *B2*				4.30 *B2*	6.10 *B2*	4.50 *B2*		6.30 *B2*	
SOUTH	Atlanta, Ga.										4.05 *A8*			
	Birmingham, Ala. Alabama City, Ala.			$56.00 *T2*	$66.00 *T2*				3.65 *R3, T2*	5.50 *T2*	3.50 *R3, T2*		5.30 *T2*	
	Houston, Texas		$62.00 *S2*		$74.00 *S2*	$78.00 *S2*			4.05 *S2*		3.90 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
B3	4.35 *B3*				5.40 *B3*	6.55 *B3*			4.10 *W6*				Buffalo, N. Y.
										† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb, deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb, add 25¢. ELECTRO: 0.50-lb, add 25¢; 0.75-lb, add 65¢.			Claymont, Del.
													Coatesville, Pa.
A2					5.65 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.10 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
B3	4.35 *B3*	4.80 *B3*			5.40 *B3*	6.55 *B3*	6.75 *B3*		4.20 *B3*	$8.55 *B3*	$7.25 *B3*		Sparrows Pt., Md.
									4.40 *A5*				Worcester, Mass.
									4.20 *R4*				Trenton, N. J.
									4.40 *L1*				Alton, Ill.
A7		4.80 *A7*	4.65 *A7*										Ashland, Ky.
		4.80 *R3*											Canton-Massillon
W8					5.40 *U1*				4.10 *A5,R3, N4*				Chicago, Ill.
R3,J3	4.35 *R3,J3*		4.65 *R3*		5.40 *R3,J3*	6.55 *R3,J3*			4.10 *A5*				Cleveland, Ohio
G3 *M3*	4.55 *G3*				5.95 *G3*	7.10 *G3*							Detroit, Mich.
													Duluth, Minn.
U1, Y1,I3	4.35 *U1, Y1,I3*	4.80 *U1,I3*	4.65 *U1,I3*	5.20 *U1*	5.40 *U1,I3* 5.90 *Y1*	6.55 *U1,I3* 7.05 *Y1*		5.40 *I3*	4.10 *Y1*	$8.45 *B3, U1, Y1*	$7.15 *U1,I3*	5.85 *U1* 5.30 *Y1*	Gary, Ind. Harbor, Indiana
G2	5.05 *G2*	5.50 *G2*	5.35 *G2*								$7.35 *G2*	6.05 *G2*	Granite City, Ill.
		5.20 *C9*											Kokomo, Ind.
	4.35 *A7*		4.65 *A7*	5.20 *A7*									Middletown, Ohio
N3 *S1*		6.00 *N3*		6.00 *N3*	5.40 *S1*								Niles, Ohio Sharon, Pa.
U1, J3,A7 *A3*	4.35 *U1, J3,A7*	4.80 *U1*	4.65 *U1*		5.40 *U1,J3*	6.55 *U1,J3*	7.20 *U1*		4.10 *A5* 4.30 *P6*	$8.45 *U1,J3*	$7.15 *U1,J3*	5.85 *U1*	Pittsburgh, Pa.
									4.20 *P7*				Portsmouth, Ohio
W3,W5	5.35 *F3* 4.35 *W3,W5*	4.80 *W3,W5*		5.20 *W3,W5*	5.75 *W3*	6.90 *W3*				$8.45 *W3,W5*	$7.15 *W3,W5*	6.15 *W5* 5.85 *F3*	Weirton, Wheeling, Follansbee, W. Va.
U1, R3, Y1	4.35 *R3, Y1*	5.50 *R1*	4.65 *Y1*	6.05 *E2*	5.40 *U1,R3* 5.90 *Y1*	6.55 *R3* 7.05 *Y1*		6.05 *R1,E2*	4.10 *Y1*	$8.45 *R3*	$7.15 *R3*		Youngstown, Ohio
K1	5.30 *K1*				6.35 *K1*	7.50 *K1*			4.90 *K1*				Fontana, Cal.
C7													Geneva, Utah
													Kansas City, Mo.
C7		5.55 *C7*						5.40 *C7*	4.90 *B2,C7*	$9.20 *C7*	$7.90 *C7*		Los Angeles, Cal.
									4.35 *C6*				Minnequa, Colo.
C7	5.30 *C7*	5.55 *C7*											San Francisco, Cal.
													Seattle, Wash.
													Atlanta, Ga.
R3,T2	4.35 *T2*	4.80 *R3,T2*			5.40 *T2*			4.75 *R3*	4.10 *R3,T2*	$8.55 *T2*	$7.25 *T2*		Birmingham, Ala.
									4.50 *S2*				Houston, Texas

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'r. Bright
EAST	Bethlehem, Pa.				4.30 *B3*	5.40 *B3*	5.55 *B3*					
	Buffalo, N. Y.	3.70 *B3,R3*	3.70 *B3,R3*	4.60 *B5*	4.40 *B3,R3*	5.40 *B3*	5.55 *B3*	3.70 *B3*				4.85 *W6*
	Claymont, Del.							4.15 *C4*		4.85 *C4*		
	Coatesville, Pa.							4.15 *L4*		5.25 *L4*		
	Conshohocken, Pa.							4.15 *A2*	4.75 *A2*	5.05 *A2*	5.90 *A2*	
	Harrisburg, Pa.							6.30 *C3*	6.30 *C3*			
	Hartford, Conn.			5.10 *R3*		5.85 *R3*						
	Johnstown, Pa.	3.70 *B3*	3.70 *B3*		4.30 *B3*		5.55 *B3*	3.70 *B3*		4.75 *B3*	5.65 *B3*	4.95 *B3*
	Newark, N. J.			5.00 *W10*		5.75 *W10*						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.10 *W10*								
	Sparrows Point, Md.		3.70 *B3*					3.70 *B3*		4.75 *B3*	5.65 *B3*	4.95 *B3*
	Worcester, Mass.					5.75 *A5*						5.15 *A5,W8*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.15 *L1*										5.05 *L1*
	Ashland, Ky.							3.70 *A7*				
	Canton-Massillon	3.70 *R3*		4.55 *R3,R2*	3.95 *T5* 4.30 *R3*	4.90 *T5* 5.40 *R3,R2*						
	Chicago, Ill.	3.70 *U1, R3, W8*	3.70 *R3*	4.55 *A5,B5, W8,W1*	4.30 *U1,R3 W8*	5.40 *R3,W8 W10,B5,L2* 5.45 *A5*		3.70 *U1,W8*	4.75 *U1*	4.75 *U1*	5.05 *U1*	5.10 *W7* 4.85 *R3,A5, K2,N4*
	Cleveland, Ohio	3.70 *R3*	3.70 *R3*	4.55 *A5,C13*		5.45 *A5*	5.55 *R3,J3*	3.70 *R3,J3*	4.75 *J3*		5.05 *R3,J3*	4.85 *A5,C13*
	Detroit, Mich.	3.85 *R5*		4.70 *P8,R5* 4.80 *P3*	4.45 *R5* 4.65 *G3*	5.50 *R5* 5.55 *P8* 5.60 *P3*						
	Duluth, Minn.											4.85 *A5*
	Gary Ind. Harbor Indiana	3.70 *U1, Y1, I3*	3.70 *U1,I3, Y1*	4.55 *R3,M5, L2*	4.30 *U1,I3, Y1*	5.40 *R3,M5, L2*	5.55 *U1,I3* 6.05 *Y1*	3.70 *U1,I3, Y1*	4.75 *I3*	4.75 *U1*	5.65 *U1,I3* 6.15 *Y1*	5.10 *M4*
	Granite City, Ill.							4.40 *G2*				
	Kokomo, Ind.											4.95 *C9*
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							3.95 *S1*		5.20 *S1*	5.70 *S1*	
	Pittsburgh, Pa.	3.70 *U1,J3*	3.70 *U1,J3*	4.55 *R3,A5, J3,S8,W10, C8*	4.30 *U1,C11*	5.40 *C11,S8, W10,C8,A5*	5.55 *U1,J3*	3.70 *U1,J3*	4.75 *U1*	4.75 *U1*	5.65 *U1,J3*	4.85 *A5,J3* 5.10 *P6*
	Portsmouth, Ohio											5.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	3.85 *W3*						4.00 *W3,W5*				
	Youngstown, Ohio	3.70 *U1,R3, Y1*	3.70 *U1,R3, Y1*	4.55 *Y1,F2*	4.30 *U1, Y1, C10*	5.40 *Y1,C10, F2*	5.55 *U1* 6.05 *Y1*	3.70 *U1,R3, Y1*			5.65 *R3* 6.15 *Y1*	4.85 *Y1*
WEST	Fontana, Cal.	4.40 *K1*	4.40 *K1*		5.35 *K1*		6.60 *K1*	4.30 *K1*		5.70 *K1*	6.25 *K1*	
	Geneva, Utah							3.70 *C7*			5.65 *C7*	
	Kansas City, Mo.	4.30 *S2*	4.30 *S2*		4.90 *S2*							5.45 *S2*
	Los Angeles, Cal.	4.40 *C7,B2*	4.40 *C7,B2*		5.35 *B2*		6.25 *B2*					5.80 *C7,B2*
	Minnequa, Colo.	4.15 *C6*	4.50 *C6*					4.50 *C6*				5.10 *C6*
	San Francisco, Cal.	4.45 *B2* 4.40 *C7*	4.45 *B2* 4.40 *C7*				6.30 *B2*					5.80 *C7*
	Seattle, Wash.	4.45 *B2*	4.45 *B2*				6.30 *B2*	4.60 *B2*			6.55 *B2*	
SOUTH	Atlanta, Ga.	4.25 *A8*	4.25 *A8*									5.10 *A8*
	Birmingham, Ala.	3.70 *R3,T2*	3.70 *R3,T2*				5.55 *T2*	3.70 *R3,T2*			5.65 *T2*	4.85 *R3,T2*
	Houston, Tex.	4.10 *S2*	4.10 *S2*		4.70 *S2*			4.10 *S2*				5.25 *S2*

UNIVERSITY OF MICHIGAN LIBRARIES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Clalmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.

C1 California Cold Rolled Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Steel Corp., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Geneva Steel Co., Salt Lake City
G2 Globe Iron Co., Jackson, O.
G3 Granite City Steel Co., Granite City, Ill.
G4 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Corp., Oakland, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mill Co., Seattle,

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal, Iron & R. R. Co., Birmingham
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Steel Co., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Co., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except B'ham, San Fran., Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Phila., add 25¢; N. Y., add 30¢.)

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As Rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.54–6.44	6.80–7.05	8.20	6.03	.....	6.13	6.13	6.01	6.63	.....	.....	.....	.....
Birmingham*	5.59	6.37	7.20–7.35[1]	5.54	.....	5.85	5.70	5.52	7.60	.....	.....	.....	.....
Boston	6.25	7.03	8.48–8.59	6.15–6.20	7.74–8.70	6.38–6.63	6.20–6.25	6.05–6.16	6.61–6.92	10.25–10.30	10.55–10.63	11.95	12.15–12.28
Buffalo	5.50–5.54	6.28–6.32	8.20–8.26	5.86	.....	5.89–5.98	5.80–5.82	5.52–5.55	6.18–6.45	10.15	10.45–10.52	11.80	12.10–12.17
Chicago	5.54	6.32	7.85	5.49	.....	5.65–5.70	5.65	5.47	6.05–6.30	.....	10.10	.....	11.75
Cincinnati*	5.87	6.39	8.32	5.79	.....	6.17	6.12	5.77	6.66	.....	10.52	.....	12.17
Cleveland	5.54	6.32	7.96–7.98	5.65	.....	5.82–5.95	5.95–5.98	5.77–5.95	6.15–6.40	.....	10.21	.....	11.86
Detroit	5.74	6.49	8.55	5.78	.....	6.17	6.12	5.76	6.60	.....	10.37	.....	12.12
Houston	6.35–6.58	7.37–8.09	8.57	6.15	.....	6.39–6.42	6.32–6.35	6.38	8.38–8.63	10.95	11.12–11.25	11.40	12.62–12.90
Indianapolis, del'd	5.94	6.72	8.25	5.89	.....	6.10	6.05	5.87	6.80	.....	10.50	.....	.....
Kansas City	6.22–6.40	7.64–7.68	8.66–8.70	6.10–6.90	7.81	6.38–6.74	6.43–6.48	6.20–6.77	7.01–7.22	10.00	10.10	11.50	11.80
Los Angeles	6.30	8.10–8.45	9.30–9.35	6.40	10.45	6.30	6.30	6.25–6.35	8.15	11.30	11.30	13.05	13.50
Memphis*	6.25	7.03	7.51	6.20	.....	6.36	6.36–6.61	6.33–6.57	7.11	.....	.....	.....	.....
Milwaukee	5.71	6.48	8.02	5.66	.....	5.81–5.87	5.82	5.64	6.31–6.57	.....	10.17	.....	.....
New Orleans*	5.98	7.01	8.26	5.93	.....	6.09	6.09	5.91	7.02	.....	.....	.....	.....
New York*	6.09–6.52	6.90–6.91	8.27–8.45	6.36–7.19	7.67	6.46–6.88	6.08–6.40	6.22–6.42	7.03–7.29	10.45	10.49–10.75	12.10	12.14–12.40
Norfolk	6.68	.....	.....	6.33	.....	6.20	6.20	5.95	7.30	.....	.....	.....	.....
Philadelphia*	5.79–6.07	6.72–7.22	8.10–8.38	6.04–6.08	7.15	6.05–6.19	5.84–6.09	6.02–6.27	6.91–7.16	9.82–10.17	10.23–10.47	11.82	11.88–12.12
Pittsburgh	5.54	6.32	7.85–8.25	5.59–5.84	.....	5.65–5.70	5.65	5.47	6.15–6.40	.....	10.10	.....	11.75
Portland	7.25	8.70–9.00	9.10–9.25	7.30	.....	6.80	7.17	7.00	8.65	.....	.....	.....	.....
Salt Lake City	7.95	.....	9.80–10.35	8.00	.....	7.45	7.60	7.95	.....	.....	.....	.....	.....
San Francisco*	6.51–6.59	7.88–8.23	9.10–9.25	6.44–6.45	10.45	6.38–6.50	6.25	6.34–6.45	8.15–8.20	11.30	11.30	13.05	13.50
Seattle	6.14–6.81	7.84–8.98	9.55	7.35–7.40	.....	6.75–6.78	6.37–6.70	6.60	8.80–8.94	.....	.....	.....	.....
St. Louis	5.73–5.84	6.62–7.15	8.15	5.77–5.79	7.66–8.15	6.02–6.10	6.05–6.22	5.77–5.80	6.43–6.70	10.08	10.40	11.73	12.05
St. Paul*	6.14	6.92	8.45	6.09	.....	6.25	6.25	6.07	6.75	.....	.....	.....	.....

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanizing sheets, for quantity.
EXCEPTIONS: (1) 500 to 1499 lb.

STAINLESS STEELS

Base price, cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7* McKeesport, Pa. *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa *W2;* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* New Britain, Conn., *S7;* Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7;* Wallingford, Conn., *W1.*

Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft. Wayne *J4.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Trenton, N. J., *D3;* Baltimore *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3* (type 416 add ½¢); Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3.*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.
WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $280 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½-3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	34.0	12.0	37.0	16.0	39.0	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Cleveland *R3*	36.0	14.0	39.0	18.0	41.5	21.5	42.5	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland *K1*	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh *J3*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh *N2*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Alton, Ill. *L1*	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon *M3*	36.0	13.0	39.0	17.0	41.5	21.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Pittsburgh *N1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling *W5*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland *W4*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown *Y1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt. *B3*	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Cleveland *R3*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland *K1*	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh *J3*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh *N2*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
Alton, Ill. *L1*	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0	....	....	....	....	....	....
Sharon *M3*	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Pittsburgh *N1*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling *W5*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland *W4*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown *Y1*	35.5	15.0	39.5	19.0	41.0	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ¼ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 19.50¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Meter	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge *A3*	....	7.25	8.50	9.30	9.85	....	....
Granite City *G3*	....	7.95	9.20	....	....	....	....
Ind. Harbor *B3*	6.75	7.25	....	....	....	....	....
Mannsfield *E2*	7.25	7.75	9.00	9.80	....	....	....
Niles, O. *N3*	7.05	7.55	....	....	....	....	....
Vandergrift *U1*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O. *R3*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville *A7*	6.75	7.25	8.50	9.30	9.85	10.40	11.10

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem *B3*	54.00	54.50	55.00	55.50	....	....	....
Birmingham *R3*	48.38	48.88	....	....	....	....	....
Birmingham *W9*	48.38	48.88	....	....	....	....	....
Birmingham *S5*	48.38	48.88	....	....	....	....	....
Buffalo *R3*	52.00	52.50	53.00	....	....	....	....
Buffalo *H1*	52.00	52.50	53.00	....	....	63.75	....
Chicago *I4*	52.00	52.50	52.50	53.00	....	....	....
Cleveland *A5*	52.00	52.50	52.50	53.00	57.00	....	....
Cleveland *R3*	52.00	52.50	52.50	....	....	....	....
Daingerfield, Tex. *L3*	48.00	48.50	48.50	....	....	....	....
Duluth *I4*	52.00	52.50	52.50	53.00	....	....	....
Erie *I4*	52.00	52.50	52.50	53.00	....	....	....
Everett, Mass. *M6*	....	59.75	60.25	....	....	....	....
Fontana *K1*	58.00	58.50	....	....	....	....	....
Geneva, Utah *U1,Y1*	52.00	52.50	52.50	53.00	....	....	....
Granite City, Ill. *K3*	53.90	54.40	54.90	....	....	....	....
Hubbard, Ohio *Y1*	52.00	52.50	52.50	....	....	....	....
Ironton, Utah *C7*	52.00	52.50	....	....	....	....	....
Jackson, Ohio *J1,G1*	....	....	....	....	....	62.50	....
Lyle, Tenn. *T3*	....	....	....	....	....	....	66.00
Monessen *P6*	54.00	....	....	....	....	....	....
Neville Island *P4*	52.00	52.50	52.50	53.00	....	....	....
Pittsburgh *U1*	52.00	....	....	53.00	....	....	....
Sharpsville *S3*	52.00	52.50	52.50	53.00	....	....	....
Steelton *B3*	54.00	54.50	55.00	55.50	60.00	....	....
Swedeland *A2*	56.00	56.50	57.00	57.50	....	....	....
Toledo *I4*	52.00	52.50	52.50	53.00	....	....	....
Troy, N. Y. *R3*	54.00	54.50	55.00	....	60.00	....	....
Youngstown *Y1*	52.00	52.50	52.50	53.00	....	....	....
N. Tonawanda, N. Y. *T1*	....	52.50	53.00	....	....	....	....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per net ton for each 0.5 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above Bessemer ferrosilicon prices are $1 over comparable silvery iron.

BOILER TUBES

Per 1000 ft. cut, 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.67	28.68	21.99	25.86
	2½	12	39.48	35.84	29.57	34.78
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.39
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48	....	....
	2½	12	29.65	36.32	....	....
	3	12	34.00	41.64	....	....
	3½	11	40.34	49.41	....	....
	4	10	51.21	62.72	....	....
Pittsburgh Steel	2	13	....	27.00	....	....
	2½	12	30.49	37.15	....	....
	3	12	34.95	42.59	....	....
	3½	11	41.48	50.54	....	....
	4	10	52.65	64.16	....	....

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.00
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 94.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipment less	$123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7*	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa. *S9*	....	6.80	7.40	9.35	11.65
Cleveland *A5*	4.65	6.45	7.40	9.35	11.65
Detroit *D1*	5.60	6.65	7.25	....	....
New Castle, Pa. *B4*	5.35	6.80	7.40	9.35	....
New Haven, Conn. *D1*	5.85	6.75	7.35	....	....
Sharon, Pa. *S1*	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va. *W3*	5.35	6.80	7.40	9.35	11.65
Worcester, Mass. *A5*	4.95	6.75	7.70	9.65	11.95
Youngstown *C5*	....	6.80	7.40	9.35	11.65

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base	Col.	Woven Wire Fence 9–15½ ga. Base	Col.	Fence Posts Base	Col.	Single Loop Bale Ties Base	Col.	Twisted Barbless Wire Base	Col.	Galv. Barbed Wire Base	Col.	Merch. Wire Annld ¢/lb.	Merch. Wire* Galv. ¢/lb.
Alabama City *R3*	118		126		....		123		....		136		5.70	5.95
Aliquippa, Pa. *J3*	118		132		....		....		136		140		5.70	6.15
Atlanta *A8*	121		133		....		126		126		143		5.95	6.40
Bartonville *K2*	118		130		....		123		143		143		5.70	6.15
Buffalo *W6*	....		....		....		....		....		....		6.85	....
Cleveland *A6*	125		....		....		....		....		....		5.70	6.15
Cleveland *A5*	....		....		....		....		....		....		5.70	6.15
Crawfrdsvl. *M4*	....		132		....		....		....		143		5.95	6.40
Donora, Pa. *A5*	118		130		....		123		140		140		5.70	6.15
Duluth *A5*	118		130		....		123		140		140		5.70	6.15
Fairfield, Ala. *T2*	118		130		....		123		....		140		5.70	6.15
Houston *S2*	126		138		....		....		....		148		6.10	6.55
Johnstn., Pa. *B3*	118		130		....		....		140		....		5.70	6.15
Joliet, Ill. *A5*	118		130		....		123		....		140		6.70	6.15
Kokomo, Ind. *C9*	120		132		....		125		138		142		5.80	6.05
Los Angeles *B2*	....		....		....		....		....		....		6.65	....
Kansas City *S2*	130		....		....		135		....		152		6.30	6.75
Minnequa *C6*	123		138		130		128		146		146		5.95	6.45
Monessen *P6*	124		135		....		....		....		143		5.95	6.40
Moline, Ill. *R3*	....		....		136		....		....		....		....	....
Pittsburg, Cal. *C7*	137		....		....		147		156		166		6.65	6.80
Portsmouth *P7*	124		137		....		....		147		147		6.10	6.60
Rankin, Pa. *A5*	118		130		....		....		140		140		5.70	6.15
So. Chicago *R3*	118		126		140		123		....		136		5.70	5.95
S. San Fran. *C6*	....		....		....		147		....		166		6.65	7.10
Sparrows Pt. *B3*	120		....		....		125		142		142		5.80	6.25
Sterling, Ill. *N4*	118		130		....		123		140		140		5.70	6.15
Struthers, O. *Y1*	....		....		....		....		....		....		6.70	6.15
Torrance, Cal. *C7*	138		....		....		....		....		....		6.65	....
Worcester *A5*	124		....		....		....		....		....		6.00	6.45
Williamsport, Pa. *S10*	....		....		150		....		....		....		....	....

Cut Nails, carloads, base $7.35 per 100 lb. (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*), Wheeling, W. Va. (*W5*), $7.15.

* Alabama City and So. Chicago don't include zinc extra.

UNIVERSITY OF MICHIGAN LIBRARIES

Look into this to cut parts cost without cutting quality

The object of this inspector's interest at Barium's Geometric Stamping Company might prove interesting, and profitable, to you.

He's examining a metal part (a truck radiator frame) that's lighter, smarter and *lower-cost* because Geometric has years of know-how on precision stampings and assemblies.

It may pay you to investigate what this Barium subsidiary can do for you by stamping, if you use medium and heavy metal parts.

If stamped parts can't solve your particular steel need, you'll probably find the answer elsewhere in the Barium family. Barium's fifteen member companies, working in steel, supply industry with steel in many forms, and are ready to work as a self-contained unit to speed urgently needed orders.

Address your steel problem to Barium Steel Corporation, 25 Broad Street, New York City.

BOLTS — Bayonne Bolt Corporation

STEEL PLATE — Central Iron and Steel Company

PIG IRON — Chester Blast Furnace

CRANES AND HOISTS — Clyde Iron Works, Inc.

SPRINGS — Cuyahoga Spring Company

BOLTS AND NUTS — Erie Bolt and Nut Company

METAL STAMPINGS — Geometric Stamping Company

DROP FORGINGS — Globe Forge, Inc.

HEAVY FLAT DIE FORGINGS — Industrial Forge and Steel, Inc.

AIRCRAFT ENGINES AND PRECISION ASSEMBLIES — Jacobs Aircraft Engine Company

MARINE DIESEL AND GASOLINE ENGINES — Kermath Manufacturing Company, Kermath Limited (Canada)

STRUCTURAL SHAPES AND STEEL FABRICATIONS — Phoenix Bridge Company, Phoenix Iron and Steel Company

BARGES AND TUGS — Wiley Manufacturing Company

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.60	4.00	4.70	....	....	....	....	....
Chicago *R3*	....	....	....	6.15	....	....	....	....
Cleveland *R3*	....	....	....	....	....	9.35	....	....
Ensley *T2*	3.60	4.00	....	....	....	....	....	....
Fairfield *T2*	....	4.00	4.70	6.15	5.60	....	4.50	9.80
Gary *U1*	3.60	4.00	....	....	....	....	4.50	....
Ind. Harbor *I3*	3.60	....	4.70	6.15	5.60	....	4.50	....
Johnstown *B3*	....	4.00	....	....	5.60	....	....	....
Joliet *U1*	....	4.00	4.70	....	....	....	....	....
Kansas City *S2*	....	....	....	6.40	....	....	....	9.85
Lackawanna *B3*	3.60	4.00	4.70	....	....	....	4.50	....
Lebanon *B3*	....	....	....	6.15	....	9.35	....	9.85
Minnequa *C6*	3.60	4.50	4.70	6.15	....	....	4.50	9.85
Pittsburgh *R3*	....	....	....	....	....	9.35	....	....
Pittsburgh *O1*	....	....	....	....	....	9.35	....	9.85
Pittsburgh *P5*	....	....	....	....	....	....	....	9.85
Pittsburgh *J3*	....	....	....	6.15	....	....	....	....
Pitt'g., Cal. *C7*	....	....	....	....	....	....	4.65	....
Seattle *B2*	....	....	....	6.65	....	....	4.65	....
Steelton *B3*	3.60	....	4.70	....	....	....	4.50	....
Struthers *Y1*	....	....	....	6.15	....	....	....	....
Torrance *C7*	....	....	....	....	....	....	4.65	....
Youngstown *R3*	....	....	....	6.15	....	....	....	....

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢
High-carbon chromium					62.5¢
Oil hardened manganese					35¢
Special carbon					32.5¢
Extra carbon					27¢
Regular carbon					23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*28.00	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

70% or more	$43.00
60% or less	40.00

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List Less Keg.	K.	Less Keg.	K.
	Reg.		Hvy.	
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	29½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thus ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished	48—10
Packaged, plate finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger	$7.85

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

REFRACTORIES

Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.00
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.00
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.50

Grain Magnesite *Bt. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$62.70
Domestic, f.o.b. Chewalah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢... $13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower lake ports. 1952 prices not yet established. 1951 prices were:

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

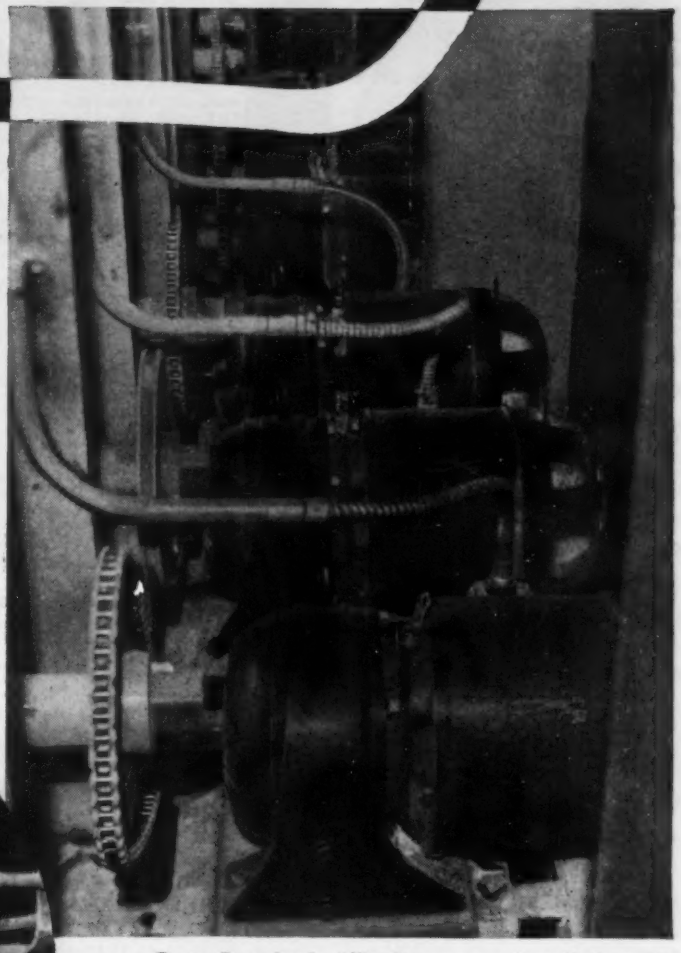
After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	7.4¢ to 9.9¢
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.45
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$2.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	$1.00
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	28.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	$3.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungstein, 99% (65 mesh)	$4.00
Zinc, 10 ton lots	23.0¢ to 30.0¢

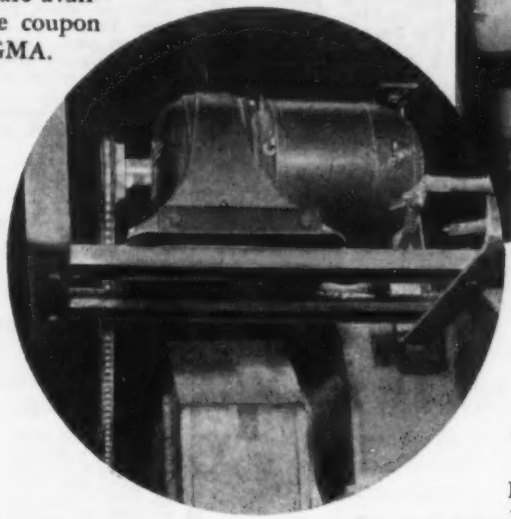
engineered for tough jobs ideal for ANY job



Here is a battery of Foote Bros.-Louis Allis Gearmotors at work for the International Milling Company in Detroit. Enduring heavy loads under excessive dust conditions, these units are providing positive, uniform power, day in and day out, under rugged service.

These Gearmotors incorporate Duti-Rated Gears with file hard surfaces and resilient cores, assuring maximum strength in minimum size. The cast iron housings give rigidity, and the large oil reservoir with splash lubrication means continuous, trouble-free operation.

Foote Bros.-Louis Allis Gearmotors are available in single, double and triple reductions to provide output speeds of 780 down to 7.5 r.p.m. Capacities from 1 h.p. through 150 h.p. Open drip-proof, splash-proof, enclosed and explosion-proof motors are available. Mail the coupon for Bulletin GMA.



Foote Bros.-Louis Allis Gearmotors installed at the International Milling Company, Detroit, Michigan.

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Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
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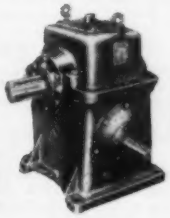
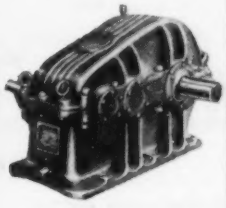
Line-O-Power Drives



Hygrade Drives



Maxi-Power Drives

Foote Bros. Gear and Machine Corporation
Dept. M, 4545 South Western Boulevard
Chicago 9, Illinois
Send me Bulletin GMA on
Foote Bros.-Louis Allis Gearmotors.

Name.....

Company.....

Position.....

Company Address.....

City.....*Zone*.....*State*.....

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C ...	30.50	0.20% C ...	29.50
0.10% C ...	30.00	0.50% C ...	29.25
0.15% C ...	29.75	1.00% C ...	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.14
0.50% max. C.	1.10
9 to 11% C.	1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$185
F.o.b. Etna, Clairton, Pa.	$188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	74.00	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C 7.00% max. Si	21.25	23.10	24.30

Alsifer, 20%Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 19.15¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.000. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta

$3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.

$1.41

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton

10 tons to less carload	$65.00
	$75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

$1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	$1.50
Less ton lots	1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

$177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered

$5.00

Ferrovanadium, 35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.35

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.

	$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5

$1.33

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots	21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk	7.00¢

Boron Agents

Borosil, contract prices per lb of alloy, del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B

$0.35

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound	10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots

$1.20

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.95
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	$1.00
No. 6	65¢
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	$1.40
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.

Less ton lots	$1.30

Silcaz, contract basis, delivered.

Ton lots	45.00¢

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Ideal for use with inert gas. Lets you handle "hard-to-weld" metals with ease — aluminum, magnesium, brass, copper, stainless, high carbon, high alloy, and low carbon steels

A touch of your toe instantly gives you the exact heat you need — there's no time lag! That's how this P&H AC Welder gives you the instantaneous control you don't get with other welders.

When you use it on high frequency with inert gas, you can fabricate to close tolerances. And there's no burn-back to oxidize the metal before you get started.

The P&H Inert Gas Welder saves production time these five ways — no other welder makes the work so easy:

1. Foot switch automatically starts power, high frequency, gas, water.
2. Arc starts instantly without touching work.
3. Foot control instantly provides exact heat needed *while* welding.
4. Foot switch cuts power and high frequency immediately or gradually at completion of weld.
5. Automatic time delay shuts off gas and water.

There are other outstanding P&H AC Welder features: P&H Dial-lectric Control that eliminates moving parts — for lower maintenance cost, easier operation. Built-in high-frequency unit that eliminates additional external equipment. Stepless amperage regulation. Unusual arc stability. Selector switch that gives operator choice of standard or high frequency.

Cut *your* welding time for non-ferrous and "hard-to-weld" metals. Get faster, easier, sounder welds — fewer rejects. Use a P&H AC Welder.

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Ingersoll Rand 33" x 20½" x 24" Complete with 635. H.P. G.E. Syn. Motor 2300/3/60.
2873 cu. ft. Worthington 29" x 21" x 18½" x 21". Complete with Elec. Equipment.

BELT GRINDING UNIT
Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to ⅜" thick x 30" wide x 30' long.

BENDING ROLL
No. 6 Hilles & Jones Pyramid Type Plate Bending Roll, Capacity 16' x ¾" Plate Complete with Electrical Equipment.

BRAKE—LEAF TYPE
16' x ¾" Dreis & Krump Leaf Type Bending Brake, Motor Driven with 40 H.P. A.C. Motor.

BUILDING
72'6" x 140' Steel Building—NEW—Designed for Corrugated Steel Siding and to carry load of 30 ton overhead electric traveling crane.

BULLDOZER
#9 William White Bulldozer, Motor Driven with 50 H.P. Motor. 440 v. 3 ph. 60 cycle. Face of Crosshead 20" x 90", Movement of Crosshead 24".

CRANES
Two—5 ton P&H Cranes 55' Span 220/3/60 AC. Each equipped with two 2½ ton trolleys and five motors.
5 ton Niles Crane 56' 3⅜" Span. Three motors, 440 volt, 3 phase, 60 cycle.
5 ton Shaw Crane 70' Span, 230 Volt D.C. Magnetic Control & Cable Reel. Hydraulic Brake, Fish Belly Box Girder.

FLANGING MACHINES
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment and numerous dies.

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.
15 ton Heroult Model V-12 Electric Melting Furnace Top Charge hydraulically operated. Complete with Transformer Equipment.
25 ton Moore Size "NT" Melting Furnace, with 7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.
40 ton Tilting Type Open Hearth Furnace, Complete with tilting mechanism, charging platform, motors and Wellman-Seaver-Morgan charging Machine.

GEAR REDUCER
600 H.P. Farrell Birmingham Herringbone Gear Unit. R.P.M. 7.20 to 74.54 NEW.

HAMMER
10,000 lb. Chambersburg Steam Drop Hammer.

PLANERS
48" x 48" x 20' Cincinnati, Four Head
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

PLATING MACHINE
Type "B" Crown Full Automatic Nickel & Chrome Plating Machine, Max. Work Size 16" wide x 36" deep x 4" thick.

PRESS—KNUCKLE JOINT
1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, 2½" Stroke, 18" Shut Height.

ROLLING MILLS
8" x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.
12½" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.
12¼" x 20" Waterbury Farrel Single Stand Two High. Complete with Gear Reducer and 50 H.P. A.C. Motor.
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

TESTING MACHINES
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.
100,000 lb. Olsen Universal Hydraulic Testing Machine. Three Dial Type

TRIMMING LINE
#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys ⅛" max. Trimmed width 22" min. 66" max. Scrap Length ¾" min. 2¼" max.

WELDERS
700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide.
40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation.

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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Price Book Blues—Government failure to issue a price book is keeping good used equipment out of the market in the Pittsburgh area. Dealers are being urged to go direct to Congress in an effort to prod the Office of Price Stabilization into releasing the long-awaited listing of machinery prices.

Dealer pressure is expected to have little effect, however. The OPS is working on a price book but will not issue it until after the amendment to Ceiling Price Regulation 80 is passed. Dealers are stuck for the time being.

Not for Sale—Meanwhile, Pittsburgh district dealers cite instance after instance where owners of machinery in strong demand prefer to let it lay idle in their shops rather than dispose of it at what they consider scrap prices. For example, there are two shears that could be sold immediately. But the owner, unable to establish the age, and knowing they are worth more than 15 pct of the new price, is holding onto them.

It is also becoming more difficult to obtain needed price information from machine manufacturers. Even offers to pay for information are not enough to persuade some builders to provide the details.

It is, of course, possible to obtain a fill-in form from the OPS, but this is a time-consuming process. Dealers need the information at their fingertips.

Gestapo in Pittsburgh—Resentment is growing about Gestapo-like practices of OPS investigators seeking information on possible violations at auction sales in Pittsburgh. The OPS men approached at least one dealer to find out if he had noted anything illegal at a recent sale. Feeling is OPS agents should know enough about the law to do their own sleuthing.

In Detroit, many used and rebuilt machinery dealers have stopped attending auctions but not because of the OPS. Reason is users have horned in to such an extent that obtaining machinery of recent vintage at less than ceiling prices is out of the question.

As a result many are now scouting small shops that were formerly customers, to see what machines can be picked up at reasonable prices. Storerooms are full, but little of the stock is up-to-date.

Many larger plants are rebuilding their own tools rather than scrap machinery normally ready for retirement. This rebuilding program cuts costs and saves tools that might be hard to replace.

Imports to Dip—Imports of new European machine tools are still high, but most dealers anticipate a sharp drop. Current heavy import volume is based on previous orders and since the machinery is not selling as well as expected, fewer orders are being given.

Traffic in lathes has eased off already, but radials and heavy duty machinery like Nos. 4 and 5 horizontal millers are still being brought in at a lively clip. Germany which produces most of the European heavy machinery is pacing the field in exports, with Italy, France and Belgium following.

Source Exhausted—Virtually no used European machinery is being imported. The only volume in this line was in imports of U. S. equipment previously shipped to Europe under Lend Lease. That source of used machinery has been completely exhausted.

U. S. dealers are still unable to export used machinery to foreign markets. Demand for our equipment would probably be high, but foreign dollar shortages keep transactions at a minimum.

Max Wender, president of Montgomery Engineering Co., Detroit, has spent most of this month in northern Europe assembling a shipment of European machinery for resale in the U. S.